THE IRON TRADE REVIEW

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RAILROAD BUYING

BECOMES A MORE IMPORTANT MARKET FACTOR.

Westinghouse Inquiry Develops Some Low Prices—Basic Buying at Pittsburg and St. Louis.

Milder weather continues to have a quickening influence on the iron and steel markets, and reports of moderate improvement come from nearly all parts of the country except the Pacific coast, where weather conditions have been extremely unfavorable. Export business continues good and prices are advancing.

Pig Iron Output

The pig iron production of February was surprisingly heavy, the average daily output being 86,747 tons, against 83,871 tons in January. February being a short month, the total production was 2,428,937 tons, against 2,599,995 tons in January.

Pig Iron Conditions

In the Pittsburg and Cleveland districts, interest has centered on the inquiry of the Westinghouse interest for 15,000 tons of pig iron. The purchase had not been made, but it is understood that some low prices have been named, and that the business will not net the furnaces much above $16 at their plants, which is considered very near cost, when using new ore at the advanced prices. At St. Louis, 15,000 tons of basic has been purchased, and at Pittsburg several round lots of 2,000 and 3,000 tons of the same grade have been contracted, and an inquiry for 10,000 tons is pending. In eastern territory, the cast iron pipe interests have been the principal factors, the leading interest being in the market for 18,000 tons, after having purchased 4,000 tons within a few days. There is still no difficulty in obtaining southern iron at $13, Birmingham, for No. 2, but a number of furnaces are quoting considerably higher. Mahoning valley malleable has been sold in Philadelphia on a basis of $15.85, furnace.

Railroad Buying

There are numerous indications of increased railroad buying and some good orders have already been placed. Rail sales of the week amounted to about 20,000 tons to northern and southwestern lines. Structural contracts have been numerous, including 2,600 tons for the Atlantic Coast line, 2,100 tons for the Great Northern, 2,500 tons for the C., H. & D., 460 tons for St. Paul, and 500 tons for the San Antonio & Arkansas Pass. The New Haven has also placed an order for 1,000 tons of bridge plate. The Merchants' Despatch Transportation Co. contracted for 12,000 axles from the Carnegie Steel Co., and business in this line shows much improvement. Tentative car business in sight is estimated by steel authorities as about 40,000 cars, of which probably 20,000 are in definite state and likely to be soon placed. The largest of these are the Harriman lines, 5,500, and the Southern railway, 6,200, including 2,600 to be built in its own shops. The Southern will probably buy this week.

Cast Iron Pipe

The leading interest has taken an order for 5,800 tons of cast iron pipe for the city of Chicago. The city has the privilege of increasing the tonnage 50 per cent. The same interest was low bidder on 3,500 tons for Cleveland, and 1,000 tons for Toledo.

Finished Material

Some reports of shading of structural material are still being heard, but cutting seems to be confined to a few companies. With the approach of the warm weather, a very large number of structural projects will be pushed to completion. While pretty good delivery can be given on light sheets, the delivery on galvanized and blue annealed is slow. There is little new tin plate tonnage being booked as present, but production continues heavy. The heavy users of steel bars are seeking information as to what can be done in regard to contracting, and some have placed orders for limited amounts for early requirements.

Coke and Old Material

The coke market shows some improvement. There is still considerable irregularity in prices. The old material market also shows improvement in some sections, but likewise displays irregularity in quotations.

BASIC BUSINESS

Of Fair Size at Pittsburg—Westinghouse Orders Not Yet Placed.

Pittsburg, March 9. (By wire.)

One of the local steel companies which bought between 2,000 and 3,000 tons of basic pig iron for second quarter the past week is reported to be in the market for approximately 10,000 tons. All told, between 6,000 and 7,000 tons of basic have been sold here during the week, but it has been impossible to determine a definite market price. Some middlemen are known to have offered basic as low as $16 a ton. Most furnace interests decline to quote below $17, valley. Heavy tonnage is involved in the basic and Bessemer inquiries pending.

Definite action on the Westinghouse Electric & Mfg. Co. inquiry for 15,000 tons of foundry pig iron, 10,000 tons of which will go to the Cleveland plant and 5,000 tons to the Allegheny plant, will be taken this afternoon.

The total amount of iron ore imported through the port of Philadelphia during February was about 75,000 tons. During the month there were also brought in about 10,000 tons of steel scrap and about 4,000 tons of pig iron.

THE WEEK IN IRON CENTERS

PITTSBURG.

Increase in Orders for Finished Material—Pig Iron Buying.

Office of THE IRON TRADE REVIEW, 510 Park Building, Mar. 8.

The break in the unusual winter conditions which has existed all over the country and which retarded movement in all lines has been followed by a genuine improvement in the general iron and steel market. Sound evidence of the change for the better is found in the fact that there is an increase in new bookings and specifications in practically every line. Some of the new buying comes from unexpected sources and there is a decidedly optimistic feeling on the part of both makers and consumers with regard to the outlook for the remainder of the year. Most mills are running full time and have enough tonnage on their books to assure steady operation for several months.

With the possible exception of pipe and wire products, all branches have benefited by developments of the last week. In these two departments, there is a large volume of business in sight and mill operations are fairly active, but new bookings are not as heavy as is usually expected at this season of the year. The sheet market continues to show improvement as to new buying and specifications. Manufacturers are exceptionally busy and are calling for prompt shipment on their contracts, although jobbers have not yet covered for their requirements. Can manufacturers are complaining that they cannot operate their plants to capacity on account of the failure to obtain prompt shipments on tin plate contracts. Demand for steel bars is heavier than at any time since December last, and there has been no improvement in promised deliveries. Mill operations have been affected slightly on account of the railroads and other consumers of bar iron not covering for their season's requirements.

Vast tonnage is involved in new structural work coming out and makers and fabricators anticipate a busy season. Rail mills are fairly active, total bookings for the week showing a slight increase. More activity is shown in the semi-finished steel market. There are reports of price concessions on small Bessemer billets for desirable tonnage, but the market, taken as a whole, is firm. Makers of plates are optimistic and anticipate heavy buying shortly.

The pig iron market is showing a much firmer tone and some of the present buying is said to be due to the fact that an advance in prices can be expected in the near future. There is also a much better feeling as regards the coke market and slightly higher prices are being asked by some producers. The old material market shows a little more strength this week and no further decline in prices is expected.

Pig Iron.—One of several interesting features of the pig iron market this week is the fact that two of the local steel companies have purchased basic pig iron for second quarter delivery. The Colonial Steel Co. bought approximately 3,000 tons for delivery during April, May and June, and another local company has bought between 2,000 and 3,000 tons. The Colonial Steel Co.'s inquiry was general and there is much speculation as to the price paid. While there is a great deal of secrecy regarding this deal, it is understood that the price was either $16.25 or $16.50, valley. In the other deal, it is understood that some deduction was made for interest on the investment, the company not being able to take the iron until May. This same company recently bought approximately 1,800 tons in three lots at exceptionally low prices. The basic market shows a much firmer tone and some of the furnace interests are not quoting below $17, valley. It is estimated that inquiries are now pending in this district for about 15,000 tons of basic, and additional sales are expected shortly.

Several new inquiries for Bessemer pig iron are noted, although no sizable sales have been made since the sale of 20,000 tons of Bessemer to two steel companies, as noted last week. It is generally expected that three or four local consumers will come into the market for heavy tonnage of Bessemer within the next ten days. A local steel company, which heretofore had used basic almost exclusively, is said to have purchased 500 tons of Bessemer for making a special grade of wire. The Bessemer market is firm at $18, valley, notwithstanding reports of alleged shading.

There are several inquiries for foundry pig iron pending, the largest of which is the Westinghouse inquiry for 15,000, which likely will be closed within a day or so. Some of the new inquiries are for second half delivery.

There is little demand for either gray forge or malleable pig iron at present and it is difficult to determine a market price, as some exceptionally low quotations are said to have been made recently by some producers. The pig iron market, taken as a whole, is much stronger and a general buying movement within the next 20 days is predicted by some.

Pig Iron Prices.

(Prompt Shipment.)

Bessemer, valley	$18.00
Bessemer, Pittsburg	18.90
Basic, valley	16.25
Basic, Pittsburg	17.15
No. 2 foundry, Pittsburg	17.40
Gray forge, Pittsburg	16.40
Malleable, Pittsburg	17.15

(First Quarter.)

Bessemer, valley	18.00
Bessemer, Pittsburg	18.90
Basic, valley	16.25
Basic, Pittsburg	17.15
No. 2 foundry, Pittsburg	17.40
Gray forge, Pittsburg	16.40
Malleable, Pittsburg	17.15

Ferro-Alloys.—Users of ferro-alloys appear to be well covered and there is little buying at present. There are a few inquiries out for 50 per cent ferro-silicon, and a few scattered sales of ferro-manganese in carload lots, on a basis of $43.50 to $44, Baltimore, for prompt shipment, are noted.

We quote ferro-manganese at $43.50 to $44, Baltimore, for immediate shipment or for first half, and from $44 to $44.50 for second half. The freight rate from Baltimore to Pittsburg is $2.30 per ton.

Fifty per cent ferro-silicon is quoted at $62.50 to $63.50, Pittsburg; domestic 12 per cent, $25.90; 11 per cent, $24.90; 10 per cent, $23.90, Pittsburg, for prompt, first quarter, and $1 advance for second quarter. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—It is roughly estimated that most makers now have sufficient tonnage on their books to insure steady operation of their plants for the next four or five months. There is a large volume of new business in sight, some of which in all probability will be placed before the end of the month. Specifications are not quite so heavy as last week, and there is not a great amount of new business coming out at present. Makers are optimistic, and with tonnage now on the books and the new business in sight, they feel confident that they will be kept busy throughout the year. The Carnegie Steel Co. has received an order for 12,000 axles from the

Merchants' Despatch Transportation Co., which will be used to equip approximately 3,000 cars for the New York Central railroad. The fact that additional car orders are being placed has given this market a stronger tone. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.55c to 1.60c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 inch and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Manufacturers are calling for prompt shipment of sheets, and makers report that the demand at present is exceedingly heavy. Notwithstanding reports of price concessions on the part of one or two independents, makers report that this market is showing a much firmer tone than at any time since December last. While it is true that jobbers are not buying as heavily as expected at this time of the year, manufacturers all over the country are consuming an unusually large amount of sheets. In the southwest, outside work has been started in earnest and demand for sheets from that section is particularly heavy. Present sheet prices, Pittsburg base, are as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, Nos. 3 to 8, 1.70c; Nos. 9 to 10, 1.75c; Nos. 11 and 12, 1.80c; Nos. 13 and 14, 1.85c; Nos. 15 and 16, 1.95c; box annealed sheets, Nos. 10 and 12, 2.05c; Nos. 13 and 14, 2.10c; Nos. 15 and 16, 2.15c; Nos. 17 to 21, 2.20c; Nos. 22 to 24, 2.25c; Nos. 25 and 26, 2.30c; Nos. 27, 2.35c; No. 28, 2.40c; No. 29, 2.45c; No. 30, 2.55c; galvanized sheets, Nos. 12 to 14, 2.50c to 2.55c; Nos. 15 and 16, 2.60c to 2.65c; Nos. 17 to 21, 2.75c; Nos. 22 to 24, 2.90c; Nos. 25 and 26, 3.10c; No. 27, 3.30c; No. 28, 3.50c; No. 29, 3.60c; No. 30, 3.85c; painted roofing sheets, $1.70 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $3 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—Owing to the fact that users of tin plate generally are covered for their needs up to July 1, there is little new tonnage being booked at present. Production continues heavy, and there appears to be some disappointment on the part of tin can manufacturers because makers are unable to make deliveries as promised. Some of the tin can manufacturers are unable to operate their plants to capacity on account of the lack of suitable material. In some cases, consumers, who are unable to secure prompt delivery on contracts placed some time ago, are placing small orders for prompt shipment with new plants opened recently. The base price in tin plate, over which some premiums have been paid for desirable business, is as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburg district.

Rails and Track Material.—There has been no noticeable change in the rail market during the week. Total bookings are probably a little heavier, while specifications against contracts are about the same as during the closing week in February. Lumber interests are buying a fairly large volume of rails for replacement and development work. There is little, if any, change in mill operations, and it is likely that production will continue at the present rate for some weeks at least. Some of the railroads are preparing to begin spring work and are asking for prompt delivery. The demand for track bolts continues heavy on account of the railroads taking up maintenance work. We quote standard Bessemer rails as follows, the base price for open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails on base weight of 40 to 45 pounds, $28, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.75c to 1.80c, Pittsburg; hand spikes, 1.80c to 1.85c, Pittsburg; track bolts, 2.50c, Pittsburg.

Steel.—More activity is shown in some lines of the semi-finished steel market. A local interest has sold approximately 1,500 tons of Bessemer sheet bars at a price slightly above $29, makers' mill, and the market is believed to be firm at that figure. Although some makers are said to have sold small lots of Bessemer billets at $27 on account of users being unable to take the full tonnage contracted for during the first quarter, $27.50 is regarded as the minimum at most mills. Owing to the sold up condition of some plants, open-hearth billets are as scarce as ever. Some fairly good inquiries for semi-finished steel are coming out, but comparatively few sales are being made.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $27.50 to $28, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $30 to $31, Pittsburg. Forging billets are quotable at $32 to $33, Pittsburg. Sheet and tin bars are quoted at $28.50 to $29 at makers' mill, located within the $1, Pittsburg, freight limits.

Hoops and Bands.—Following the adjournment of the annual conventions of the principal users of hoops it is expected that there will be a heavy demand for hoops and bands. While there is little new business coming in at present, specifications continue heavy and prices are firm. We quote the market as follows:

Hoops in carload lots, 1.60c to 1.65c; in less than carload lots, 1.70c to 1.75c; bands, 1.50c to 1.55c, base, with net extras as per standard steel.

Merchant Bars.—A firmer tone is shown in the steel bar market, both as to new buying and specifications. A few makers are now accepting business for second half delivery, although they are not soliciting this tonnage. Deliveries range from four to five months at some plants and only a few makers are in a position to accept new tonnage for delivery up to July 1. There is little life to the bar iron market, as the railroads and other users are still holding off in placing orders. Mill operations have been affected because of the lighter demand, and it is rumored that slightly lower prices are being quoted in some instances. Little, if any, new business is being offered at 1.75c, Pittsburg, and there is little doubt that 1.65c could be done on desirable tonnage. We quote the market as follows:

Common iron bars, 1.70c to 1.75c, Pittsburg; Bessemer and open-hearth steel bars, 1.45c to 1.50c; plow and cultivator, 1.45c to 1.50c; channels, angles, zees, tees, under 3-inch, 1.45c to 1.50c all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Planished and machine straightened tire is 1.70c, base; iron finished tire under 1½ by 1½ inches, 1.65c, both plus net extra on tire card; iron finished tire, 1½ by ½ and over, 1.50c, plus net extra on the steel bar card.

On cold rolled strip steel, with 1½ inches and wider, and 0.100-inch and

thicker, we quote base prices for 100 pounds, $3.35 on hard, and $3.60 on soft, except in carload lots of one size, where the price is lower.

Structural Material.—Heavy tonnage is involved in new structural work now coming out and announcements of fairly large contracts are expected by March 15. Prospective builders are now prepared to go ahead with work that has been held up for some time on account of unfavorable weather conditions. Bids were closed March 8 for 500 tons to be used in an addition to the Philadelphia Co. building, Pittsburg. The Pittsburg Railways Co. has started actual construction on the new Oakland (Pittsburg) car barns, which will require about 1,800 tons. Contracts for steel for the proposed bridge across the Allegheny river, Pittsburg, involving 8,000 tons, and the Eighteenth regimental armory, Pittsburg, which will require 500 tons, have not yet been awarded. Plans for four bridges in western Pennsylvania, involving fairly heavy tonnage, have been approved, and it is expected that bids will be asked within ten days. Makers of structural steel and fabricators are greatly encouraged with developments of the last week. Their plants are working on orders placed recently, and with the new work now in sight, it is expected that they will be kept busy for the next several months. Local steel makers deny that the 1.55c, Pittsburg, quotation on beams is being shaded in Pittsburg and points west, although they admit that 1.50c is being done in the east where competition is keen.

Beams and channels, 15-inch and under, 1.55c to 1.60c; over 15 inches, 1.65c to 1.70c; zees, 1.55c to 1.60c; tees, 1.55c to 1.60c; angles, from 3 to 6 inches, 1.55c to 1.60c; over 6 inches, 1.55c to 1.70c; universal and sheared plates, 6¼ inches wide and wider, 1.55c to 1.60c.

Merchant Pipe.—Some disappointment is shown by makers of tubular goods on account of the small amount of new business coming out, due entirely to weather conditions. Makers report that they have enough tonnage on their books to assure steady operations of their plants for some months, but there has not been as much life in the buying line as is usually expected for the month of March. Jobbers are still showing a hesitancy in increasing their stocks. Several interests continue to book small orders each week, and, while a number of big line projects are expected to be taken up this year, there is no indication that this work will be started in the immediate future. We quote the following official discounts in carload lots, subject to the usual discount to the largest buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches, and in plugged and reamed lots:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	70	54	65	..
⅜ inch	71	57	66	52
½ inch	74	62	69	57
¾ to 6 inch.....	78	68	73	63
7 to 12 inch.....	72	57	67	52
13 to 15 inch.....	51½	..	..	..
PLUGGED AND REAMED.				
1 to 4 inch.....	76	66	71	61
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	63	51	58	46
½ to 4 inch.....	70	58	65	53
4½ to 8 inch.....	66	54	61	49
9, 10, 11 and 12 inch	59	47	54	42
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	59	48	54	43

Boiler Tubes.—Conditions surrounding the boiler tube market are satisfactory to makers. Specifications continue heavy, and there appears to be a slight increase in new bookings. Mill operations are a little more active than at this time last month.

	Steel.	Iron.
1 to 1½ inch.....	49	43
1¾ to 1¼ inch.....	61	43
2½ inch	63	48
2¾ to 5 inch	69	55
6 to 13 inch.....	60	43

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

Wire Products. — More favorable weather conditions in some sections of the country have resulted in more activity in the wire products market. Arrangements are now being made to start some of the outside work which has been held up on account of weather conditions, and indications are that the demand for wire and nails this year will be quite heavy. In the immediate Pittsburg district, however, buyers are not inclined to increase their stocks, and there is little buying from this source. Price concessions are still reported in certain sections, although the market, taken as a whole, is thought to be a little stronger. We quote the market as follows, contracts for the jobbing trade being limited usually to 60 days:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; painted barb wire, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; with 30c for galvanizing; plain wire to jobbers in carloads, $1.65, and to dealers, in carloads, $1.70; polished staples, $1.85; galvanized staples, $2.15.

Wire Rods.—Demand for wire rods is perhaps a little heavier this week, although the increased buying has not been of sufficient volume to necessitate a change in mill operations. Specifications are fairly heavy. We quote the market at $33 and $35, Pittsburg, on Bessemer and open-hearth rods.

Coke.—The coke market continues to show improvement, and the trade generally believes that prices will gradually increase as a result of the lighter production in the Connellsville region and the increased demand from many sections. Notwithstanding that the belief is growing that there will not be a suspension of mining operations April 1, some consumers have closed for fairly large quantities of coke for April delivery. Others have made arrangements to buy, and will do so, should the coal operators and miners fail to agree upon a wage scale within the next ten days. Several good inquiries for delivery over the last half are noted, and it is likely that some large sales will be made shortly. The improvement in the pig iron situation has caused a much better feeling as regards the coke trade. Production this week is being curtailed about 15 per cent. It is believed that within the next two weeks operators in the Connellsville region will be in a position to slightly increase production. It is noted that some of the operators are now asking slightly higher prices than a week ago. We quote standard Connellsville furnace coke, for prompt shipment, at from $2.25 to $2.35, ovens, and on contract from $2.30 to $2.40, ovens, although lower prices are quoted in some cases. On high grade Connellsville foundry coke, we quote from $2.90 to $3.00, ovens, for prompt delivery. On contract we quote from $2.95 to $3.10. The Connellsville *Courier's* figures for the week ending Feb. 26 show 36,427 ovens active with an output of 461,774 tons, compared with 36,645 active ovens and a production of 463,123 tons the previous week.

Old Material.—There appears to be a much better feeling as regards the old material market. One large consumer in the Pittsburg district is said to have bought a large tonnage of old rails within the last ten days. A few scattered sales of various grades are also noted. Anticipating an advance in prices within the next 20 days, some producers are holding out for higher prices. With the exception of machine shop turnings, the prices of practically all grades of scrap are the same as last week. On machine shop turnings, the quotation has been dropped 25 cents, the general asking price now being from $11.50 to $12. We quote, gross tons, delivered in the Pittsburg district, including Monessen,

Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$16.75 to 17.25
Rerolling rails	17.50 to 18.00
Bundled sheet scrap	14.75 to 15.25
Iron axles	26.50 to 27.00
Old iron rails	18.00 to 18.50
No. 1 wrought scrap	18.00 to 18.50
Old car wheels	17.00 to 17.50
Low phosphorus	20.50 to 21.00
Machine shop turnings	11.50 to 12.00
Cast borings	9.50 to 10.00
No. 1 cast scrap	16.25 to 16.75
Malleable	16.00 to 16.50
Stove plate	12.50 to 13.00

CHICAGO.

Good Volume of Structural Contracts —Pig Iron Dealers Confident.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Mar. 8.

With what is possibly a slightly quieter week in transactions, there seems to be no diminution of the hopeful feeling which has been more apparent in the recent past. It is a rather peculiar feature of the situation, that the consumer of pig iron has been fortunate enough to take advantage of the weakness which developed in that market some weeks ago, and to turn it to his own advantage by remaining out of the market until forced to purchase by the necessities of his requirements. In the finished and semi-finished lines, the situation is very different, as manufacturers are turning away business which they can not execute within the required time. Some heavy producers have been forced to allow some very attractive tonnages to go by, for the reason that their rolling is engaged so far ahead that the orders would not be reached for several months. Structural contracts for the week were of good volume, and distributed among a number of fabricators. Rail sales also reached a very good total, the leading interest booking 22,000 tons, while an eastern mill sold 500 tons of traction rails for Illinois delivery. Information which seems reliable is to the effect that railroad buying which will come into the market within a short time will give equipment houses more business than they comfortably can handle. Jobbers report a continuation of the very good store business which has been coming in for many weeks, and the heavy demand, coupled with slow delivery from mills, has resulted in badly broken stocks, especially in bar iron and shafting.

Pig Iron.—The fact that the daily average production of the blast furnaces of the country was larger during February than in January, as shown by THE IRON TRADE REVIEW monthly report, has not had any apparent effect on the market. Were the situation not improving, such a condition of heavy production would be taken advantage of, to depress prices, but, notwithstanding the fact that the hesitation on the part of buyers has contributed to the weak feeling in pig iron, it is not apparent that the bear argument contained in figures of increasing production has been taken into account. All pig iron dealers express confidence in the future of the market, and, while there is still some talk of low prices, it also is true that much of the low-priced, re-sale iron, if not most of it, has been removed from the market. Quite a large percentage of the iron which has been pressing on the market within the past few weeks was consignment iron, and as the very severe weather of the past winter held much of this iron back, while in transit, there was quite a lot of it arriving at one time, when shipping conditions had improved. The result was, that, in their anxiety to save heavy demurrage charges, sales agents made very considerable price concessions. As stated above, this iron has been purchased, to a large extent, and no longer acts as a depressing influence. Some figures of stocks of pig iron held by the furnaces, which information is obtained through private and confidential channels, indicate that the total amount of iron on hand has made a substantial reduction. If these figures can be verified, and they are claimed to be accurate, they make a very encouraging showing. Local sales for the past week were not heavy, but an increasing inquiry is reported. A car wheel interest in this district bought 2,400 tons of high silicon iron, and the order is supposed to have gone to a Tennessee furnace. The sale of 15,000 tons of basic to the Commonwealth Steel Co., of St. Louis, the latter part of last week, was made at an attractive price to the buyer. A portion of the order was secured by the St. Louis Blast Furnace Co., but the heavier end of the business went to Ohio. We quote:

Lake Superior charcoal	$19.00 to 19.50
Northern foundry No. 2	18.50 to 19.00
Southern foundry No. 2	17.85 to 18.35
Southern silveries, 5 per cent silicon	18.90 to 19.40
Jackson Co. silveries, 8 per cent.	22.40 to 22.90
Malleable Bessemer	18.50 to 19.00
Alabama basic	18.35 to 18.85

Billets.—Some of the eastern mills continue to report occasional sales of small tonnage, but aside from this there is little doing in the way of actual transactions. Local production is large, but it is not more than adequate to supply producers' own requirements and the regular contracts which they have had running with billet consumers, for many months.

Merchant Bars.—The same active condition exists in this market as indicated by previous reports. The demand is well distributed, but there is an especially heavy business doing in bars for reinforced concrete work. The demand is so strong and the supply so limited that almost any sort of substitute is accepted, and without very close inspection as to external appearances. Store business is satisfactory in volume, and prices are well maintained, tires having advanced from 1.90c to 2.00c, base.

We quote, for Chicago delivery, as follows:

Bar iron, 1.60c to 1.65c; hard steel bars, re-rolled, 1.60c to 1.65c; soft steel bars and bands and small shapes, 1.68c to 1.78c, base; hoops, 1.78c to 1.88c; planished or smooth finished tire steel, 1.88c to 1.93c; iron finish, up to 1½ by ½ inch, 1.83c, base, tire card; iron finish, 1½ by ½-inch and larger, 1.68c, base, bar card; channels for solid rubber tires, ¾ to 1 inch, 2.18c, flat, and 1⅛ inches and larger, 2.08c, flat; smooth finished machinery steel, 1 inch and larger, 2.43c; flat sleigh shoe, 1.73c; toe calk steel, 2.23c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 55 per cent off the list for carload lots, and 50 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel bars from local stocks, we quote as follows: Bar iron, 2c to 2.10c, base; soft steel bars, 1.90c to 2c per 100 pounds, base; soft steel hoops, 2.40c to 2.50c, full extras.

Structural Material.—Contracting for fabricated material has proceeded with considerable activity the past week. A number of buildings have been taken by competitors of the leading interest, their prices being somewhat lower. The variation in price has been greater than it is at present, the independents moving up to a closer approximation of the Corporation's figures. The leading fabricating interest reports no contracts for the past week. The Chicago Bridge & Iron Works secured a bascule bridge for the Soo Line, requiring 87 tons of steel. The Continental Bridge Co., Peoria, Ills., was given the contract for a building for the United States Gypsum Co., Fort Dodge, Ia., 300 tons. The Worden-Allen Co., of Milwaukee, took 460 tons for plate girder bridges for the Chicago, Milwaukee & St. Paul road. The Wisconsin Bridge & Iron Co. se-

cured contracts from the Great Northern road for 2,100 tons of miscellaneous bridge material. This road is about to place a large tonnage of structural steel. The San Antonio & Arkansas Pass Railroad has given contracts for 500 tons of bridge material to the Virginia Bridge Co., of Roanoke and Memphis. The Denver Portland Cement Co. has awarded a contract for 400 tons to the Minneapolis Steel & Machinery Co., and the latter company also has secured 350 tons for a penstock for the Capitol City Improvement Co., Helena, Mont. The Denver City Transfer Co. building, which was to take 1,800 tons of steel, has been changed to reinforced concrete construction. F. O. Brown, of Denver, secured a contract for 80 tons from the St. Joseph hospital, in that city, for a power house. The Steel Corporation will use over 20,000 tons of steel in the construction of the initial buildings at its new steel plant at Duluth, Minn. The Chicago Telephone Co. will build a 16-story office and down-town exchange building. The foundation and steel work will be made sufficiently strong to allow for the addition of six more stories, if such addition becomes necessary, in the future.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.78c to 1.88c. For extras see Pittsburg report.

Local store prices are as follows: All angles, 3 inches and larger, including 6 inches, $2 to $2.10 per 100 pounds; angles over 6 inches, $2.10 to $2.20 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2 per 100 pounds, base; channels 3 inches and larger, $2 per 100 pounds, base.

Rails and Track Supplies.—Specifications are of good volume and new business is very satisfactory, the local interest being booked for quite a long time ahead, its sales for the past week amounting to 22,000 tons of standard section rails, mostly Bessemer. Southwestern and northern roads were the purchasers. The Chicago sales office of a Pennsylvania mill sold 500 tons of high T rails to a traction company in this state.

See Pittsburg report for prices on standard sections.

On light rails, Chicago delivery, we quote as follows: Light rails, 40 and 45-pound, $27; 30 and 35-pound, $27.75; 16, 20 and 25-pound, $28; 12-pound, $29.

Track supplies f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.85c to 1.95c; smaller size spikes, 1.90c to 2c, base; track bolts with square nuts, 2.40c to 2.60c, base; with hexagon nuts, 2.55c to 2.75c.

Plates.—Car-building prospects are very good, and present demand from this source is very heavy and increasing. Old contracts are being specified at a satisfactory rate.

We quote, Chicago delivery, as follows: Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.78c to 1.88c. For extras see Pittsburg report.

Store quotations are without change as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 72 inches, 2.35c to 2.45c; No. 8 up to 60 inches wide, 2.15c to 2.25c. Flange and head quality, 25c extra.

Sheets.—The conditions in the sheet market have undergone no change for some time, the amount of tonnage being put on the books remaining at about the same rate from week to week. Prices are being maintained at the same figures which have ruled in this market for some weeks.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents.

We quote store prices at Chicago as follows: No. 10, 2.25c to 2.35c; No. 12, 2.30c to 2.40c; No. 14, 2.35c to 2.45c; No. 16, 2.45c to 2.55c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3c to 3.10c; No. 30, 3.30c; galvanized sheets, Nos. 10 to 16, 3.20c to 3.30c; Nos. 18 and 20, 3.35c to 3.45c; Nos. 22 to 24, 3.50c to 3.60c; No. 26, 3.50c to 3.80c; No. 27, 3.90c to 4c; No. 28, 4.10c to 4.20c; No. 30, 4.50c to 4.60c.

Wire Products.—Business is beginning to pick up up more and more, and from this time until next fall, is expected to expand very materially. The talk about price-cutting seems to have disappeared. The open weather of the first few days in March has had a stimulating effect on the inquiry for all kinds of wire products.

We quote, Chicago delivery, as follows: Wire nails, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; with 30c for galvanizing; plain wire to jobbers, carload lots, $1.83; plain wire, retailers' carload lots, $1.88; staples, bright, $2.03.

Merchant Pipe and Tubes.—The market is quiet, but there is an indication of slowly returning activity as the weather moderates and makes possible the laying of more and more pipe. Discounts from mill and store are unchanged.

For mill discounts, see Pittsburg report.

We quote, out of store, as follows: Wrought steel pipe, black, ⅛-inch to ¼-inch, 68 per cent; ⅜-inch, 69 per cent; ½-inch, 72 per cent; ¾-inch to 6-inch, 76 per cent; 7-inch to 12-inch, 68 per cent. Iron pipe, about 6 points higher.

Lap-welded steel tubes, 2¼-inch to 5-inch, 60 to 62 per cent; charcoal iron tubes, 2¼-inch to 4-inch, 48 to 50 per cent, seamless steel tubes, 2¼-inch to 4-inch, 46 per cent.

Cast Iron Pipe.—The general run of business is looking up, with more municipal contracts appearing in the market each week. Railroads also are buying large quantities of culvert pipe. The leading interest secured the contract to furnish the city of Chicago 5,800 tons of pipe, the city having the option of increasing the quantity by 50 per cent. The same interest also was the lowest bidder at Cleveland, for 3,500 tons, and at Toledo, O., for 1,000 tons.

We quote prices f. o. b. Chicago, as follows: 4-inch water pipe, $28.50; 6 to 16 inches, $27.50; larger sizes, $26.50; gas pipe, $1 a ton higher.

Old Material.—This market is quiet, but the outlook is reported as favorable for improved conditions. There is little or no inquiry of an urgent character, but there is nothing in the way of stocks pressing on the market. We quote:

Old car wheels	$17.50 to 18.00
Old iron rails	18.00 to 18.50
Rerolling rails (4 ft. and over)	17.50 to 18.00
Old steel rails (2 ft. and under)	16.50 to 17.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, Switches and guards	14.50 to 15.00
Heavy melting steel	14.50 to 15.00
Shoveling steel	14.25 to 14.75

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.25 to 14.75
No. 2 R. R. wrought	13.25 to 13.75
Arch bars and transoms	17.25 to 17.75
Knuckles, couplers and springs	14.00 to 14.50
Shafting	17.50 to 18.00
Iron car axles	21.50 to 22.00
Steel car axles	22.50 to 23.00
Locomotive tires	18.00 to 18.50
Dealers' forge	12.00 to 12.25
Pipes and flues	11.25 to 11.75
No. 1 cast, 150 lbs. and less	14.25 to 14.75
No. 1 busheling	12.00 to 12.50
No. 2 busheling	9.50 to 10.00
No. 1 boiler cut	11.25 to 11.75
Boiler punchings	16.50 to 17.00
Cast and mixed borings	6.75 to 7.25
Machine shop turnings	9.75 to 10.25
Railroad malleable	14.25 to 14.75
Agricultural malleable	12.50 to 13.00
Stove plate and light cast scrap	12.25 to 12.75
Angle bars, splices, etc. (iron)	17.00 to 17.50
Angle bars, steel	14.75 to 15.25

The shipments of anthracite in Pennsylvania over the various lines for February were 5,031,784 tons, compared with 4,576,004 tons last year.

CLEVELAND.

Interest Centers in Westinghouse Pig Iron—Some Low Quotations.

Office of THE IRON TRADE REVIEW, Browning Building, Mar. 8.

Iron Ore.—The market has settled into a period of extreme quiet and there is practically nothing being done in the way of sales. Activities are being confined to preparations for extensive operations next season. On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.50; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

Pig Iron.—Interest has centered this week in the Westinghouse tonnage and it is evident that low quotations are being made by Cleveland interests for the 10,000 tons to be delivered at the Cleveland plant, and by valley interests and other furnaces, some of which have a lower freight rate than 90 cents, for the 5,000 tons to be delivered at Allegheny. It seems probable that the sales will not net the furnaces much above $16, which is considered very close to cost, on new ore. There is a very liberal inquiry and numerous sales of moderate sized tonnages have been made, quotations ranging somewhat lower than those recently made in the valley. We quote, delivered in Cleveland, as follows:

No. 1 foundry	$16.75 to 17.25
No. 2 foundry	17.00 to 17.25
No. 2 Southern	17.35 to 17.85
Gray forge	16.40
Bessemer	18.90
Lake Superior charcoal	19.50
Jackson Co. 8 per cent silvery	21.55

Coke.—Sellers express the opinion that a downward tendency in coke has been checked, but there is very little activity in the market. We quote Connellsville furnace coke, $2.00 to $2.25 for prompt delivery, and $2.25 to $2.40 for first half. We quote foundry coke at $2.75 to $3 for prompt delivery, and $3 for first half.

Finished Materials.—Inquiry pending and orders placed indicate renewed interest of railroad companies and a disposition to improve their equipment. Railroads have been among the buyers of bar iron for which the demand is improved, but some low prices are being named and some mills have difficulty in getting enough orders to keep in operation. Good delivery is being given on light sheets, but on galvanized, the principal interest names June as its earliest time for delivery and August on blue annealed. While reports of concessions on shapes are heard in western territory, a few eastern manufacturers have also taken business at low quotations. Others are very firm in their ideas, and 1.55c is the minimum at Pittsburg. Users of steel bars, whose contracts expire April 1, are in some cases placing orders for small tonnages for early requirements, as they are unwilling to contract at present quotations.

Old Material.—Beter weather for shipping has brought a number of country scrap dealers in the market with tonnages which they are anxious to sell. There is also a good deal of material in this market from the Baltimore & Ohio list. Consumers, however, do not appear to be in any greater hurry to buy than they have been for weeks past and the result is a weak market, with prices 50c lower on most of the common grades of scrap. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$17.50 to 18.00
Old steel rails (under 6 feet)	17.00 to 17.50
Old car wheels	16.50 to 17.00
Old steel boiler plate	13.50 to 14.00
Malleable iron (railroad)	15.00 to 15.50
Steel axles	20.00 to 20.50
Malleable iron (agricultural)	13.50 to 14.00
Heavy steel	14.00 to 14.50
Country mixed steel	12.50 to 13.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	12.50 to 13.00
No. 1 machine cast	14.25 to 14.50
Axle turnings	10.50 to 11.00
Machine shop turnings	8.75 to 9.50
Grate bars	11.50 to 12.00
Pipes and flues	11.00 to 11.50
Tank iron	10.50 to 11.00
Sheet iron	6.00 to 6.50
Wrought drilling	8.75 to 9.25
Stove plate	11.50 to 12.00
Cast borings	8.00 to 8.50

CINCINNATI.

Sellers Cheerful, But Some Low Prices on Steel Being Made.

Office of THE IRON TRADE REVIEW, N. E. cor. Fourth and Elm Sts., Mar. 8.

Pig Iron.—While there are no well-defined indications of any marked improvement in the situation, agents are taking a more cheerful view of things, and are hoping that the turning point has now been reached. The time is rapidly approaching when melters will of necessity be compelled to replenish their stocks, and as weather conditions improve, business which has long remained stagnant will proceed along normal lines. The situation is peculiar in several respects, and buyers are a little more restless than they were a week or two ago. Reports from salesmen who usually keep a close tab on the situation indicate a full melt, but owing to the heavy tonnage that was bought last fall, at prices below the present schedule, it looks as though consumers were willing to remain passive until later in the year, before entering into new contracts, for future requirements. Reports further indicate that there are still several thousand tons of re-sale iron floating around, which will have a tendency to hold prices to the present level, until disposed of. Quite a tonnage of this re-sale iron has been sold, for prompt delivery, as low as $13.00, Birmingham, but the larger southern furnaces, with possibly one or two exceptions, are said to be on a basis of $13.50 for prompt, and $14 for fourth quarter delivery. The indications are, however, that the $14 basis is developing little or no business, and is merely nominal in its action. It is a logical conclusion, that better could be done, in the event of sufficient tonnage developing to warrant shading prices. Northern furnaces, as a rule, are said to be in better condition as to tonnage booked, and are consequently holding firmer to established quotations. It is certain that $16.50 Ironton furnace, could be done for nearby delivery, with $17 the ruling quotation for delivery running through the last half. Silvery 8 per cent is in light demand, but shows a little more activity than during the preceding week. Quotations are on a $20 basis, Ironton furnace, and are said to be fairly well maintained. There was one sale of 1,700 tons of 4 to 5 per cent silicon to an Ohio stove concern, last half delivery, that went at a little less than quotations. There is an inquiry now pending from one of the large pipe makers for about 5,000 tons of the lower grades, for delivery in eastern territory. An inquiry from Southern Indiana is for 300 tons of southern foundry, second quarter delivery. An inquiry from an eastern Ohio concern is for 300 to 500 tons of malleable, second quarter delivery. An inquiry from a Michigan melter for 500 tons 4 to 5 per cent silicon, last half delivery, and one for 3,000 tons of charcoal iron, from a southern car wheel plant, delivery running throughout the remainder of the year. We quote for any delivery during the year, based on freight rates of $3.25 from Birmingham, and $1.20 from Ironton, as follows:

Southern fuondry No. 1	$17.25 to 17.75
Southern foundry No. 2	16.75 to 17.25
Southern foundry No. 3	16.25 to 16.75
Southern foundry No. 4	16.25 to 16.75
Southern No. 1 soft	17.25 to 17.75
Southern No. 2 soft	16.75 to 17.25
Southern gray forge	16.00 to 16.50
Northern No. 1 foundry	18.70
Northern No. 2 foundry	18.20
Northern No. 3 foundry	17.70
Jackson county 6 per cent silicon	20.20
Jackson county 8 per cent silicon	21.20
Jackson county 10 per cent silicon	22.20

Coke.—Some inquiry has developed during the week for furnace grades, for delivery over the last half, but it is a matter of conjecture whether there is any imperative demand, or consumers are merely feeling the pulse of

the market. There is, however, a good demand for foundry grades on contract, showing that the actual melt is practically normal. New contracts are light, and not coming forward for any round lots. We quote prices in the leading coke-producing districts as follows:

	Prompt shipment.	First half or year 1910.
Connellsville District:		
Foundry coke	$2.65 to 3.00	$2.75 to 3.00
Furnace coke	2.00 to 2.25	2.30 to 2.40
Wise county district:		
Foundry coke	2.75 to 3.00	2.75 to 3.00
Furnace coke	2.10 to 2.25	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.75 to 2.90	2.85 to 3.10
Furnace, coke	2.25 to 2.50	2.75 to 3.00
New River:		
Foundry coke	2.75 to 3.00	2.90 to 3.25
Furnace coke	2.25 to 2.50	2.35 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material. — The market looks a little brighter, but there is little being done in the line of new specifications. Demand from implement makers continues strong, and requests for rushing shipment on contracts are of daily occurrence. Steel bars and small shapes, sold on steel bar card are quotable at 1.50c base, Pittsburg, and plates and structural 1.60c net, Pittsburg.

Old Material.—The market is quiet, and offerings are light. Dealers are slowly turning their stocks, but at prices that are irregular and that fluctuate considerably. The situation is such, and there is so little doing, that it is practically impossible to tabulate exact quotations. We quote dealers' prices as follows:

No. 1 railroad wrought, net tons	$13.00 to 13.50
No. 1 machinery, net tons	13.00 to 13.50
No. 1 busheling, net tons	11.50 to 12.00
Old iron rails, gross tons	18.00 to 18.50
Old steel rails (rerolling), gross tons	17.00 to 17.50
Old short lengths, gross tons	15.00 to 16.00
Old iron axles, net tons	19.00 to 19.50
Heavy melting scrap, gross tons	13.50 to 14.00
Stove plate, net tons	10.00 to 10.50
Heavy turnings, net	9.00 to 9.50
Cast borings, net tons	7.00 to 7.50
Car wheels	15.50 to 16.00
Grate bars	11.00 to 11.50

NEW YORK.

Improved Tone of Finished Material —Pig Buyers More Interested.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Mar. 8.

Iron Ore.—A further falling off in the receipts of trans-Atlantic ore tonnage is expected during March because furnace yards are well stocked and boats continue rather difficult to obtain even at advanced freights. There has been some additional recent chartering from Sagunto, Spain, to north of Hatteras at 9s 6d, but this has been in connection with a prior arrangement and it is understood some interests would be willing to pay as high as 10s for boats for Mediterranean ports. Freights to Bombay, India, are lower because of the better export trade possibilities to that port. There has been a little additional selling of Swedish ores the past week, but the eastern ore market otherwise is very quiet. It is stated authoritatively that the February cargoes of the leading shipper of Cuban ores to this country reached 78,000 tons. With the improved weather conditions, eastern domestic shippers are receiving more liberal specifications and the movement from mines to furnaces is freer. Reports of some furnaces working badly are being made.

Pig Iron.—Although it may be said that consumers generally are more interested in the pig iron market than they were several weeks ago, a significant feature of the situation is the deliberation in closing upon pending inquiry. This evidently reflects the prevailing softness of prices. The International Steam Pump Co. having bought about 8,000 tons of foundry grades for its Buffalo, Harrison and Holyoke plants, is still figuring upon about 5,000 tons for East Cambridge, Mass., and Elmwood Place, O. The latter will likely go to southern furnaces. The General Electric Co. has its inquiry for 4,000 tons for Pittsfield and Lynn still pending and a New Jersey machinery builder, who has been negotiating for several weeks for 5,000 tons, also appears in no hurry to make award. Cast iron pipe interests are the most active buyers in the eastern market. Low prices on grades not considered of strict standard analysis are still being made by Eastern Pennsylvania makers, but the best brands are held at $17.50, furnace, for No. 2X. Virginia makers are asking $15.25 to $15.50 for No. 2X and the $15.00 quotation is exceptional. A little southern iron is coming in to eastern consumers and some low prices are being made on re-sale iron. The aggregate tonnage of small order business being taken in nearby New England, New York State and New Jersey points is not large. We quote, delivered at New York tidewater over the first half, as follows:

Northern foundry No. 1	$19.00 to 19.50
No. 2X foundry	18.25 to 18.50
No. 2 plain	18.00 to 18.50
No. 2 southern foundry	17.75 to 18.25
Malleable	19.25 to 19.75
Gray forge	17.00 to 17.25

Ferro-Alloys.—Scarcely more than carload trading is being done in ferromanganese. Re-sale lots are going at low prices. We quote the market at from $43.00 to $43.50, seaboard, on small lots and on 50 per cent ferrosilicon from $60.00 to $61.00, seaboard.

Finished Materials.—The better tone to the finished market continues and the outlook is for a good business volume to be placed for the spring trade as soon as weather conditions become settled. Specifications against contract are generally reported as satisfactory and while new business is still a little tardy in appearance, prospects are improving daily. The railroads are showing more activity in their car buying and bridge building operations than for some time and this is regarded very hopefully by the trade. The situation in structural steel prices, although shading is still being done, is more promising, as with the greater tonnage coming out the more aggressive makers are filling up their plants and do not seem as anxious for business. Structural contracts placed by railroads the past week have reached about 13,000 tons, of which probably 10,000 tons went to the independents. The Atlantic Coast Line placed 2,600 tons with the Virginia Bridge & Iron Co., the Great Northern 2,000 tons with the Wisconsin Bridge & Iron Works and the C., H. & D. 2,500 tons, divided into 1,300 tons to the American Bridge Co., and 1,200 tons to the McClintic-Marshall Construction Co. Other railroad lettings were Duluth, Misabe & Northern, 650 tons; the Boston & Maine, 250 tons; the Western Maryland, 200 tons, and the B. & O., 300 tons, all with the American Bridge Co. An additional order of 200 tons was let by the Baltimore & Ohio. The Worden-Allen Co. received 500 tons from the St. Paul, and the Wisconsin Bridge & Iron Works, 200 tons from the same road; Pennsylvania Steel Co. received 400 tons from the Boston & Maine, and the Virginia Bridge & Iron Co., 500 tons from the San Antonio & Arenses. The New York, New Haven & Hartford also placed a 1,000-ton bridge this week. The Putnam building, 1,000 tons, Davenport, Ia., has gone to Vierling & McDowell, and the Phoenix Mutual Life Insurance Co., Hartford, Conn., 350 tons, to the Burlington Construction Co. The McClintic-Marshall Construction Co. has been awarded 500 tons for extensions to the plant of the Girard Iron Co., Girard, O., and the Continental Bridge Co., 300 tons for buildings for United States Gypsum at Fort Dodge, Iowa. The Richmond, Va., viaduct, 500 tons, has gone to the Renard-Pattern Structural Iron Works. The Worden-Allen Co. has a 200-ton crusher for the Cleveland Cliffs Iron Co. in the ore regions. In this city, Milliken Bros., Inc., have an apartment on 116th street, 600 tons, in which Bethlehem sections will be used and Levering & Garrigues have taken 400 tons for public school No. 44. Definite action is expected shortly on the new Broadway-Lexington subway extensions in New York and Brooklyn, which will ultimately require an enormous tonnage,

as the work is to be extended over a number of years. The specifications are about to be issued. The New Jersey Zinc Co.'s inquiry for about 3,000 tons for extension at Palmerton, Pa., is still pending. The Lehigh Valley railroad's inquiry for shapes and plates for cars has not yet been placed. We quote, New York delivery, as follows:

Angles, 3 to 6 inches x ¼ inch and heavier, 1.66c to 1.76c; beams, 3 to 15 inches, 1.66c to 1.76c; tees, 3 x ¼ inch and heavier, 1.66c to 1.76c; plates, carload, tank, 1.66c to 1.76c; marine boiler, 2.06c to 2.16c; bar iron, 1.70c to 1.80c; soft steel bars, 1.61c to 1.71c; sheets, No. 28, black, 2.56c.

Cast Iron Pipe.—A better volume of business is moving and both inquiries and new orders are more numerous. Prices, however, are not firming up. The Hanover Contracting Co. is lowest bidder for the 4,500 tons of work for the city of New York and the Wilten Construction Co. for two smaller contracts, about 1,500 tons, which were opened last week. The city of Boston is receiving bids today on 2,350 tons. Six-inch pipe is quoted about $26.00 f. o. b., New York, in carload lots.

Rails and Track Material.—The New York, Westchester & Boston railroad is expected to soon place a contract for 15,000 tons of rails, but the inquiry is not yet actually in the market. The New York, New Haven & Hartford is not likely to buy until after its fiscal year ends in June. A fair amount of tee rail and girder rail business is pending. No action is reported on the large Southern Railway inquiry for standard sections.

Old Material.—The market is lacking in any feature except possibly as to its dullness, which continues to rule as a result of shipments still being shut off to many important consuming points in Eastern Pennsylvania. While the embargoes are gradually being lifted from the mills, these users still have enough stocks on hand to make them very selective in receiving additional material. The local demand for cast scrap in New York and vicinity is moderate while the iron mills of the east are also very light buyers at present. The Panama scrap recently awarded in bulk is still being offered through New York brokers, but it is apparently having little effect upon the market. The general belief is that the buyers of this scrap expect to realize considerable in the way of salvage. Little new continental scrap is now being brought in. We quote gross tons, prices New York dealers will pay at tidewater, as follows:

Old steel rails (re-rolling)	$15.50 to 16.00
Old car wheels	13.00 to 13.50
Old iron axles	23.00 to 24.00
Old steel car axles	19.50 to 20.00
Heavy melting steel	14.50 to 15.00
No. 1 R. R. wrought	16.50 to 17.00
Iron track scrap	15.00 to 16.00
Wrought pipe	13.50 to 14.00
Cast borings	9.00 to 9.50
Wrought turnings	11.00 to 11.50
Heavy cast scrap	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Stove plate	11.50 to 12.00
Grate bars	11.75 to 12.25

PHILADELPHIA.

Large Pipe Iron Tonnage Under Negotiation—General Strike a Factor.

March 8.

Pig Iron.—Cast iron pipe interests continue to be the principal buying support of the pig iron market in Philadelphia territory. The leading maker has come into the market for a block of 18,000 tons of No. 3 and gray forge for the next three months delivery which includes the 5,000 tons noted last week, and has made purchases this week against this lot, of probably 4,000 tons of southern iron. Included in the iron bought were several thousand tons of resale iron taken upon a basis of $13 Birmingham for No. 2 and $12.50 Birmingham for No. 3. The remainder of the large block pending will probably be southern iron. The pipe companies repeat their ability to obtain southern forge at about $16.50 delivered or about $12 25 Birmingham and are not interested in offers of northern forge at $17 delivered. Some low prices on Mahoning valley malleable have also been made in this district, one consumer taking 1,500 tons for the next four months, delivery at $18.50, delivered at $15.85, western furnace. Eastern Pennsylvania makers continue to quote $18.25 to $18.50 delivered for standard No. 2X or $17.50 to $17.75 at the furnace but there is little tonnage moving. Lebanon grades are available considerably under these figures. Some Virginia sellers have taken on all the tonnage up to July they care to at today's market and have made a 25 cent advance in prices to $15.25 furnace for No. 2 plain and $15.50 furnace for No. 2X or $18.25 and $18.50 delivered this territory, respectively. There is some sounding of the market by basic consumers but the market remains nominal at $18.50 delivered in the absence of sales. Some small lots of standard low phosphorus are being sold at the quoted market. Furnaces in some instances are working badly and production has been affected so that certain makers are falling behind in their shipments and are selling with caution. There is no falling off in consumption generally, as indicated by the free specifications against contract iron. The Saxton furnace resumed this week after a short shutdown for repairs. We quote for Philadelphia delivery, first half, as follows:

No. 1X foundry	$18.75 to 19.00
No. 2X foundry	18.25 to 18.50
No. 2 plain	17.75 to 18.25
Standard gray forge	17.00 to 17.25
Basic	18.50
Low phosphorus	23.00 to 23.50
No. 2 Birmingham	17.50 to 18.00
No. 2X Virginia	18.25 to 18.50
No. 2 plain, Virginia	17.75 to 18.25

Ferro Manganese.—There is a little inquiry, probably 600 tons pending. The prompt market is easy but there is scarcely sufficient business going to test it out. Resale ferro manganese has sold down to $42 seaboard to middlemen and disposed of to consumers at higher prices. The market seems quotable at about $42.50 to $43, seaboard.

Finished Materials. — The general strike condition prevailing in Philadelphia is having its effect upon the market and some work is being held up until the atmosphere clears. The operations of a number of the metal working and machinery plants are being handicapped by reason of the molders and other skilled men having obeyed the call for a sympathy strike. Despite the unfavorable labor conditions, finished lines are reported to have shown some improvement both in specifications and in new orders placed, the past week. Steel bar business has been especially good. While shape prices continue to be shaded by some mills, this condition does not seem to apply so much to immediate Philadelphia territory and on strictly local business 1.55c to 1.60c Pittsburg or 1.70c to 1.75c Philadelphia seems to more accurately represent the present market. This may be due to the fact that there are few attractive tonnages now under competition. The Fairmount hotel, 2,500 tons is still pending and the plans may be revised. Bids close March 12 on the 1,200 tons for the hot metal bridge for the Alan Wood Iron & Steel Co. at Ivy Rock, Pa. An important job to come up is that of the combined post office, court house and custom house for Richmond, Va., about 2,500 to 3,000 tons. Bids go in March 19. The hotel for Reading, Pa., which is being refigured, will close March 19. The Isthmian Canal commission will make a large award of spikes, plates, shapes and iron and steel supplies March 21. The Columbia avenue station of the Philadelphia & Reading road in this city is expected soon. The 2,000 tons of plates and shapes for the Pennsylvania railroad's car floats are still pending. The Lehigh Valley railroad

has increased its inquiry for material for cars it will build, to include 4,000 tons of plates besides a large tonnage of shapes and bars. Eastern plate mills are interested in the Portland, Ore., riveted pipe contract to close March 8 and requiring 14,000 tons. Prompt deliveries on plates are being made by makers in this section. Bar iron business continues dull. We quote the following prices on finished material for Philadelphia delivery: Structural shapes, 1.70c to 1.75c; plates 1.70c to 1.75c; steel bars 1.60c to 1.65c; refined bar iron 1.60c to 1.65c; open-hearth 4 x 4 billets, $30, eastern mill.

Sparrows Point Plant.—The first of the five furnaces at the new open hearth plant of the Maryland Steel Co., at Sparrows Point, Md., was started March 2. The other furnaces will be put on from time to time in the near future. In this connection it is quite probable that in the future most of the standard rail orders of the Pennsylvania Steel Co., either Bessemer or open-hearth, will be rolled at Sparrows Point and that the girder rails and specials will continue to be manufactured at Steelton, which is well equipped for this work. As the requirements of the rail trade call for an increasing tonnage of open-hearth steel, the duplex process will be used at Sparrows Point in a correspondingly greater degree.

Old Material.—It is persistently reported that one of the associated mills has withdrawn from this arrangement of buying, although confirmation is lacking. The mill in question has been buying recently some tonnage upon the outside. Though the association is still out of the market, it is understood that it will offer about $16.50 delivered for steel when it comes in. There is a little better tone to the market due to an improvement in the embargo situation in the east which has held up shipments to many points and to a little livelier inquiry from the west. The Coatsville embargoes have been lifted but only selected material is being accepted. The Bethlehem Steel Co. continues to receive only cast borings and some crucible stock. Foundries are taking a fair amount of cast but the rolling mill demands are still unstable. Several cargoes of scrap from the British Isles are now on their way, after several interruptions due to accidents and storms. These are old engagements however. We quote:

Old steel rails (rerolling)	$17.75 to 18.25
Heavy melting steel	16.25 to 16.75
Old car wheels	16.50 to 17.00
Old iron car axles	26.00 to 27.00
Old steel car axles	22.50 to 23.00
No. 1 railroad wrought	18.50 to 19.00
Wrought pipe	16.00 to 16.50
Cast borings	11.00 to 11.50
Wrought turnings	13.00 to 13.50
Heavy cast scrap	16.00 to 16.50
Railroad malleable	16.50 to 17.00
Stove plate	12.50 to 13.00

ST. LOUIS.

Two Large Inquiries Pending Keep Trade Rather Expectant.

March 7.

Pig Iron.—The only sale reported in the St. Louis territory today is one of from 500 to 600 tons of southern No. 2 to an Iowa concern for delivery over the next four months. The price was not made public. There are two big inquiries pending in a tentative way, however, which will liven up things considerably if they are placed, and local sales agents are hopeful that at least one of them will materialize this week. Orders for small lots are coming in slowly. The price for southern No. 2 is about $13 to $13.50, Birmingham, the lower price being for resale iron, and the higher one maintained by the furnaces. However, it is nothing unusual to hear of something doing in a small way at less than $13. Ohio iron is quoted at $16.50 to $17, Ironton. Our quotations for southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

No. 1 foundry	$17.25 to 17.75
No. 2 foundry	16.75 to 17.25
No. 3 foundry	16.25 to 16.75
No. 4 foundry	15.75 to 16.25

Coke.—The coke situation is as dull as that for pig iron, with not a single order inquiry of consequence in sight. Prices are about as follows, with a possibility that they could be shaded in some instances: Connellsville 72-hour foundry, $2.75 for prompt and $3 for contract delivery; Connellsville 48-hour, $2.25 for prompt, and $2.50 to $2.75 on contract; Virginia 72-hour, $2.75 for prompt, and $3 contract; Virginia 48-hour, $2.50 for prompt and $2.50 to $3 on contract. These prices are f. o. b. ovens in each instance. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis. By-product coke is offered at $5.80, St. Louis.

Finished Material.—Considerable interest is manifested in the request of the city of St. Louis for bids for from 700 to 800 tons of steel to be used for plate girders in the north half of the Eighteenth street viaduct. Bids will be opened March 15. The south half of the viaduct was completed about one year ago.

The following base prices are quoted, St. Louis, out of stock: Tank plates, ¼-inch and heavier, up to 72 inches wide, 2.05c to 2.15c; from 72 inches to 96 inches, 2.15c to 2.25c; sheets, No. 10, blue annealed, 2.30c to 2.40c; bar iron, 1.85c to 1.95c, base; soft steel bars, 1.95c to 2.05c, base.

Old Material.—The scrap iron market remained unchanged, with prices nominally as follows:

Old car wheels	$17.00 to 17.50
Old iron rails	19.00 to 20.00
Rerolling rails (4 ft. nad over)	16.75 to 17.25
Old stel rails e(2 ft. and under)	16.50 to 1.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	24.50 to 25.00
Frogs, switches and guards	15.50 to 16.00
Heavy melting steel	15.50 to 16.00
Shoveling steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrough....t	$14.50 to 15.00
No. 2 R. R. wrought	13.50 to 14.00
Arch bars and transoms	17.50 to 18.00
Knuckles, couplers and springs	15.00 to 15.50
Shafting	17.00 to 17.50
Iron car axles	20.00 to 21.00
Steel car axles	20.00 to 21.00
Locomotive tires	18.00 to 18.50
No. 1 country wrought	12.25 to 12.75
Pipes and flues	11.75 to 12.00
No. 1 cast 150 lbs. and less	14.00 to 14.50
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.75 to 10.25
No. 1 boiler cut	11.50 to 12.00
Boiler punchings	13.00 to 14.00
Cast and mixed borings	7.50 to 8.00
Machine shop turnings	10.00 to 10.50
Railroad malleable	13.25 to 13.75
Agricultural malleable	11.50 to 12.00
Stove plate and light cast scrap	11.50 to 12.50
Angle bars, splices, etc. (iron)	17.25 to 17.75
Angle bars, steel	15.50 to 16.00

BUFFALO.

Tone of Pig Iron Market Improved—Large Tonnage Pending.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Mar. 8.

Pig Iron.—The tone of the market is improved over what it was a week ago, and while tonnage placed was not large it shows a slight increase and more of the bigger consumers are in the market with inquiries. It is understood that there is about 50,000 tons under consideration here at this time. Furnaces are well sold and evidences of a slightly stiffer market are observed. There has been no change in prices.

We quote at furnace, f. o. b. Buffalo, as follows:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	17.00 to 17.25
No. 3 foundry	16.75 to 17.00
Gray forge	16.75 to 17.00
Malleable	17.50 to 17.75
Basic	18.00 to 18.50
Charcoal	20.00 to 21.00

Finished Products.—There has been very little activity, but sentiment with regard to the situation shows an improvement. Specifications are not coming out freely except on contract business and there is a marked absence of new structural work. The recent closings cleaned up the situa-

tion here to a great extent and the absence of new projects makes the situation on the surface appear dull. There are rumors of several office building projects, both here and in central New York, but nothing in the least definite is now obtainable.

Old Material.—Trading in this market is very dull and it is still necessary to quote merely nominal prices on scrap material. We find it necessary this week to revise the quotations and while we are quoting prices in most cases lower than have been named of late, it can hardly be considered that the old material market is any more depressed than heretofore. The lack of inquiry makes it necessary to give the prices named.

We quote gross tons, f. o. b. Buffalo, as follows:

Heavy melting steel	$15.50 to 16.00
No. 1 railroad wrought scrap	17.00 to 17.50
No. 1 railroad and machine cast scrap	15.00 to 15.50
Old steel axles	20.00 to 20.50
Iron axles	25.00 to 26.00
Car wheels	17.00 to 18.00
Railroad malleable scrap	16.25 to 16.75
Machine shop turnings	10.00 to 10.50
Cast iron borings	9.25 to 9.75
Low phosphorus steel scrap	19.50 to 20.00
Old iron rails	18.00 to 19.00
Tank iron	13.00 to 13.50
Sheet iron	9.00 to 9.50
Stove plate	13.50 to 14.00
Pipe and flues	13.00 to 13.50
Grate bars	12.00 to 12.50
Boiler plate	13.50 to 14.00

SEATTLE.

Weather Conditions Interfere Greatly With Business.

Office of THE IRON TRADE REVIEW,
942 Henry Bldg., Mar. 2.

With all the railroads centering in Seattle either completely blockaded by snowslides and floods or operated only intermittently and with the greatest difficulty, transportation throughout the state of Washington and in some parts of northern Oregon is practically at a standstill. As a result a perceptible halt in business is everywhere evident in the northwest. In the iron trade light finished lines have been most severely affected. Bars, reinforcing material, merchant pipe and sheets are notably quieter. This recession of business can be only temporary and must be followed by a sharp revival, as many important construction projects are either already under way or announced for immediate commencement.

A local can factory, one of the largest on the Pacific coast, has been forced to close on account of failure to receive consignments of tin plate already shipped from the mill.

In the machinery business, foundry trade and in structural lines the principal difficulty lies in getting material in hand which is now on the way from the east. Traffic on two trans-continental lines terminating at Seattle is completely suspended and the third, by hard work, is kept open only for intermittent trains carrying passengers and mail. Through freight traffic has been practically suspended for a week.

Pig Iron.—A delayed cargo of about 1,500 tons of English Jarrow and Cleveland arrived during the week and sold rapidly, although prices were shaded about 50 cents a ton. There is but little iron in local stocks except that held by the foundries, most of which are well supplied. No cargoes have been ordered as yet for August-September delivery, although some are expected to be negotiated within a few days. Importers are holding off on account of the unfavorable condition of the charter market. We quote gross tons as follows:

No. 1, English Jarrow, spot	$23.50 to 24.00
No. 1, Chinese, Han Yang, spot.	23.00 to 23.50
Glengarnock, Scotch, to arrive June-July	24.50 to 25.00
No. 1 English, Jarrow, to arrive June-July	23.50 to 24.00
English, Doncaster, spot	23.00
No. 1 English, Jarrow and Cleveland, to arrive March	24.00
Southern No. 2, domestic	23.75 to 24.25

Merchant Iron.—The local scrap bar mills are well supplied with business. Steel bars are moving in good volume. Deliveries of bars and light shapes from Eastern mills are slow. Some foreign steel bars have been landed recently at 1.90c base. Local stocks are in only fair condition. We quote base prices per 100 pounds f. o. b. Seattle as follows: Common iron bars, $2.30; soft steel bars, $2.50; machinery steel, $2.85; Norway iron, $3.75; angles, channels, beams and tees, under 3 inches, $2.80.

Sheets.—The trade is active. With a few notable exceptions local stocks are badly depleted and many sizes are difficult to obtain. The country demand for sheets is good and well distributed. We quote f. o. b. Seattle as follows: Blue annealed sheets, No. 12, 3.30c; No. 14, 3.35c; No. 16, 3.45c; No. 18, 3.90c; Nos. 22 to 24, 3.95c; No. 28, 4.10c; galvanized sheets, Nos. 12 to 14, 4.10c; No. 16, 4.20c; No. 18 to 20, 4.50c; Nos. 22 to 24, 4.65c; No. 26, 4.85c; No. 28, 5.35c; No. 30, 5.95c.

Old Material.—The foundry demand for cast scrap is lighter and the old material situation in general is somewhat easier. We quote net tons f. o. b. Seattle as follows:

Foundry scrap, No. 1 grade	$19.00 to 20.00
Foundry scrap, No. 2 grade	15.50 to 17.00
Old car wheels	16.00 to 17.00
Railroad wrought	10.00 to 11.00
Miscellaneous steel scrap	5.00 to 9.00

BIRMINGHAM, ALA.

Sales of Pig Iron Light and Prices Still are Irregular.

Birmingham, March 7.

Inquiries, as well as sales, the past week, have been light. The different interests continue to book small tonnages for prompt shipment, but no heavy buyer so far has been found in the market. The furnace interests maintain prices of $13.50 to $14 per ton at the furnace, No. 2 foundry basis. Conservatively speaking, we should say that for second quarter delivery $13.50 would take the business, but for third quarter, $14. One or two producing interests seem to be inclined to sell through the entire second half—a certain tonnage at least. There have also been some sales of re-sale iron made on as low basis as $13 per ton at the furnace, but the tonnage has been small and prompt shipment the additional consideration. In going the rounds this morning, we found a somewhat better feeling existing—due, as one put it, to the firmer tone to the situation in the Pittsburg district last week; and, as another forecasted, to the fact that with the opening of spring and more favorable weather the prevailing lethargy should be thrown off; and, still another gave as his opinion that shrewd buyers will not allow too long a time to slip away without making provision farther ahead than the first half of this year. Southern charcoal iron conditions are fairly good with prices of $22 to $22.50 per ton at the furnace prevailing.

BRITISH IRON MARKET.

Pig Iron Stocks Increasing—Hoping for Foreign Purchasing.

Office of THE IRON TRADE REVIEW.
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 23.

Remarkably little business has been done this week in pig iron, and within the last two days this has at last affected the rate for warrants, which has become slightly weaker. The quotation for No. 33 is 51s 3d ($12.-54) on the Cleveland market. Sellers are still buoyed up by the hope of purchases from America and Germany, although these fail to materialize yet, and today's cables will have a further depressing effect. Since the beginning of the month, 10,-000 tons have been added to store, and shipments are very small, with poor demand from the Continent. Buyers are pressing very severely

for reductions, but sellers make no material concessions, still believing that prices will advance rather than recede, and regarding the outlook as encouraging. During the past few days, tremendous contracts for iron ore have been placed with mine owners in the Nottingham district. The hematite market continues strong, especially in Barrow-in-Furness, where sales have increased lately, and prices are very firm.

METAL MARKETS.

ST. LOUIS.

March 7.

Lead and Zinc.—The top price for choice lots of zinc ore in the Missouri-Oklahoma-Kansas district last week was $47.50 a ton, with good demand sending the price for 60 per cent grades up to $45, as compared with $42.50 for the week before. The total sales were believed to exceed the output by 300 to 400 tons. Zinc blende sold at an average price of $42.29, as compared with $39.68 the previous week. Calamine brought a top price of $38 a ton, with 40 per cent grades selling for $23. The average price for calamine was $24.49, as compared with $22.50 the week before. Shipments of calamine exceeded any week of the year. Shipments of lead ore also were heavy and prices were better. The 80 per cent grades brought $54 a ton, compared with $53 the week before. The average price was $53.84, compared with $52.57 the week before. St. Louis pig lead was quoted at $4.45, compared to $4.50 the week befor.

CHICAGO.

Mar. 7.

New Metals.—There has been little change in the situation in the metal market, since last week, but all metals are holding as firmly as at that time, while there has appeared some business in future copper, which was not the case for several past weeks. We quote as follows: Lake copper, carload lots, 14 to 14⅛c; casting, 13⅝c; smaller lots, ¼c to ⅜c higher. Spelter, 5.65c to 5.70c; lead, desilverized, 4.60c to 4.65c in 50-ton lots, corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list f. o. b. La Salle in car lots of 600-pound casks; pig tin, 33c to 34c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—Trading in old metals has been neglected for some time, and last week's prices are continued, as nominally representing the market. We quote, dealers' selling prices, as follows: Copper wire, 13½c; heavy copper, 13½c; light copper, 11½c; heavy red brass, 12¾c; heavy yellow brass, 10c; light brass, 7¼c; No. 1 red brass borings, 10¼c; No. 1 yellow brass borings, 8c; brass clippings, 9½c; tea lead, 3.65c; lead scrap, 4.35c; zinc, 4½c; tin pipe, 31c; tin foil, 29c; pewter, 25c; electrotype plates, free from wood, 4½c; electrotype dross, 3¼c; stereotype plates, 5c; stereotype dross, 3½c; prime slab zinc dross, $80 per ton.

NEW YORK.

March 8.

Copper.—The continuation of the increased demand for copper that commenced in the latter part of February carried the prices of Lake, electrolytic and casting to 13.87½c, 13.62½c and 13.50c, respectively. One large independent producer quotes the last named grade on a parity with electrolytic, viz., 13.62½c, and is out of the market for all grades calling for delivery before April 1. The foreign markets have displayed a corresponding degree of strength. The total of the week's sales may be stated as 20,000,000 pounds. This, added to the estimated sales of last week, aggregates something like 50,000,000 pounds. The Producers' Association figures, due March 10, are anxiously awaited.

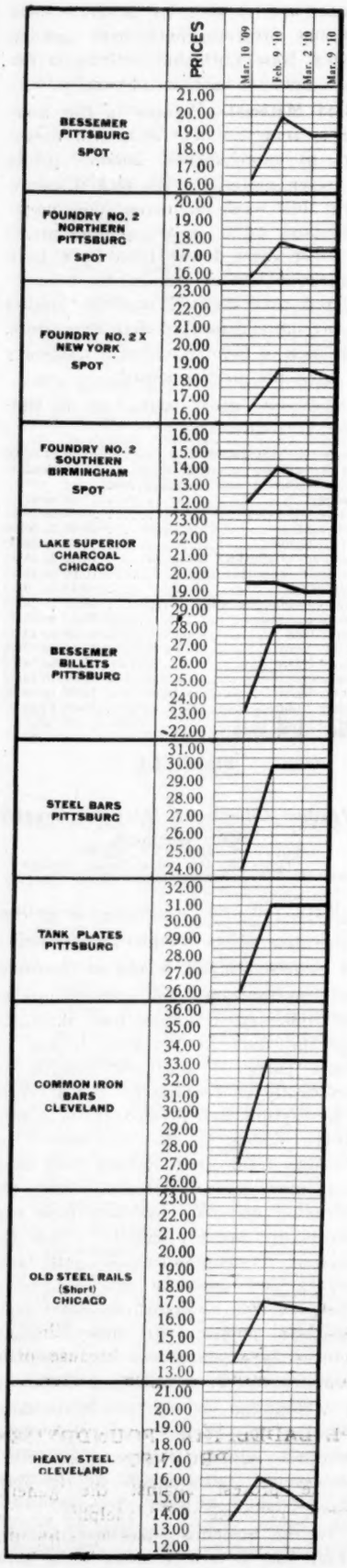
Tin.—Business has been very quiet with sales made early in the week at 32.87½c. There is still so much speculation that buyers are afraid of the market. The supply is large, 2,312 tons having arrived this month. There are 2,415 tons afloat.

Lead.—The market has been quiet and slightly lower than last week, both New York and St. Louis reporting sales 5c under the closing of Feb. 28. Business can be done today at 4.65c in New York and 4.45c in St. Louis for spot, with slight concessions for April and May deliveries. There was a sale of one carload made at 4.55c in New York, but under special conditions.

Spelter.—Displaying decided firmness the early part of the week and thereby attracting offerings of lots bought at a much lower range, the spelter market evinced some tendency to soften towards the close under the influence of these offerings. But it is doubtful if a bid for a large amount could be satisfied under the recent price of 5.85c, New York.

Antimony.—Prices are unchanged at 8.50c for Hallett's and 8.25c for Cookson's.

PRICE CHART.



STRIKE TROUBLES

Disturb Conditions in Philadelphia and Eastern Pennsylvania.

Labor dissensions in eastern Pennsylvania reached a more acute stage the past week and are now exercising a greater bearing upon the iron and steel industry of that section.

Some of the foundries, machine shops and metal working plants of Philadelphia and vicinity have been affected by a general sympathetic strike of organized and unorganized labor which was called March 6 in connection with the controversy between the employes and the traction interests of that city. On March 8 a large body of men of the Standard Roller Bearing Co. walked out, and some of the stove making shops and jobbing foundries have been similarly crippled. The larger plants allied with the iron and steel industry and including the Wm. Cramp & Sons' Ship and Engine Building Co., The Baldwin Locomotive Works Co., Midvale Steel Co., J. G. Brill Co., Link Belt Engineering Co., the Niles-Bement-Pond Co., and Henry Disston Sons & Co., have not been affected. Most of these plants are open shops. Public sentiment is being brought strongly to bear upon the persons responsible for the disturbed conditions in Philadelphia, and it is believed that the general strike will not be of long duration.

At South Bethlehem, Pa., President Schwab, of the Bethlehem Steel Co., has delivered an ultimatum to the striking workmen, declining to recognize the executive committee of the men and declaring that under no circumstances will the company deal with the men on a strike, or with a body of men representing organized labor. Mr. Schwab's statement is reported to have induced a number of men to return to their posts, and it is stated by the company that 1,000 additional men returned to work Monday, March 7. Though the strike has interfered with the operations of some departments of the works, the company is regularly making shipments of finished products and carrying on its general manufacturing activities. The Grey structural mill, which was idle for several days principally because of a broken housing, is again in operation.

PHILADELPHIA FOUNDRYMEN PROTEST.

The protest against the general sympathy strike at Philadelphia by the allied trades in connection with the street car controversy now existing in that city, was adopted at the regular monthly meeting of the Philadelphia Foundrymen's Association at the Manufacturers' Club Wednesday evening, March 2.

The paper of the evening was presented by S. S. Knight, manager of the Chester Steel Castings Co., Chester, Pa., upon "The Observations Upon Segregation Phenomena as Applied to Cast Steels." Mr. Knight has been engaged in research work for the past 15 years and he presented a most interesting and instructive address. It will be found elsewhere in this issue.

METAL TRADES MEETING IN NEW YORK.

The annual meeting of the New York-New Jersey branch of the National Metal Trades Association was held at the Machinery Club, New York, March 7, with a good representation of the members in attendance. The meeting was taken up by the presentation of reports, which showed that the association had enjoyed a successful year, and with the transaction of other matters of annual importance. The present administration was continued in authority for the ensuing year, with the exception of filling several minor vacancies which had occurred during the past year.

President Stevenson Taylor, Quintard Iron Works., was re-elected, as well as the other officers. F. Ducasse, New York Taxicab Co., and G. E. Franquist, Simplex Auto Co., were elected to the executive committee.

FOR CAR BUILDING.

The Bettendorf Axle Co., Davenport, Ia., advising respecting some new construction, says that it is completing an addition to its car fabricating plant 260 x 1,400 feet, and will use it as an erecting shop. It is an all-steel structure, which the company is fabricating and erecting itself, and will furnish a floor space of nearly nine acres under one roof.

Bourne-Fuller Stock List. — The Bourne-Fuller Co., Cleveland, has issued a new stock list, which shows in parallel columns the material which it has on hand at its Cleveland and Cincinnati yards and warehouses. By acquiring the assets and good will of the Globe Rolling Mill Co., of Cincinnati, the Bourne-Fuller Co. has obtained an additional distributing point from which to serve the trade. It has also improved its facilities for cutting and handling structural material.

FIRES DISCUSSED BY PITTSBURG FOUNDRYMEN.

An interesting address on "Reduction of Foundry Insurance" was delivered at the monthly meeting of the Pittsburg Foundrymen's Association at the Fort Pitt hotel, Monday evening, March 7, by S. G. Walker, of the Senior Mutuals Insurance Co. C. A. Anderson, of the Pittsburg Valve, Foundry & Construction Co., who was also scheduled to speak on this subject, was unable to attend. The members were deeply interested in the statistics presented by the speaker, and many of them participated in the general discussion which followed.

During the course of his remarks, the speaker pointed out that premiums on fire insurance and the loss resulting from fires, particularly in foundries, have been greatly reduced in recent years as a result of the installation of sprinkler systems, which, he said, are gradually being placed in many of the principal foundries throughout the country. Statistics were presented showing premiums paid before the sprinkler system was introduced as compared with rates in effect at present. According to the speaker, the fire loss in the United States is about $250,000,000 a year, while the structural loss is about one-half of the new structures erected each year. The speaker stated that the installation of the sprinkler system means an additional expense of 10 per cent on investment, and that by this method the loss by fire has been reduced about 90 per cent.

WILL REBUILD ON LARGER SCALE.

The Mt. Vernon Bridge Co., whose plant at Mt. Vernon, O., was recently destroyed by fire, received a number of offers from other cities to change the location of its plant, but the company decided to accept the offer of the citizens of Mt. Vernon to contribute $20,000 if the plant were rebuilt in Mt. Vernon. Practically all of the money has been raised, so that it is assured that the plant will be rebuilt in Mt. Vernon. The new plant will be about double the size of the old one.

The American Steel Foundries has issued a report for the six months ended Jan. 31, 1910, which shows total earnings, after deducting expenses, of $723,906, which, after the deduction of interest, depreciation and taxes of $407,692, leaves a net income of $316,044.

RELATIVELY LARGER FEBRUARY PRODUCTION

Complete returns from the coke and anthracite blast furnaces of the United States show that the total pig iron production, exclusive of charcoal, for February was 2,428,937 tons, compared with 2,599,995 tons in January, which had three more working days. The average daily production for January was 83,871 tons, while the daily production for February shows the rather surprising average of 86,747 tons.

MONTHLY PRODUCTION.

	1910.	1909.	1908.
January	2,599,995	1,788,164	1,043,374
February	2,428,937	1,682,470	1,086 809
March	.....	1,822,644	1,229,856
April	.....	1,730,608	1,155,122
May	.....	1,866,757	1 168,002
June	.....	1,930,029	1,106,300
July	.....	2,088,620	1,228,604
August	.....	2,232,642	1,366,019
September	.....	2,375,589	1,416 252
October	.....	2,604,037	1,573,824
November	.....	2,532,740	1,582,314
December	.....	2,682,702	1,723,664
Total	2,597,181	25,337,002	15,680,140

The February production of merchant iron was 796,987, or an average daily production for the month of merchant iron of 28,464 tons, compared with a daily average in January of 26,299 tons. The total February production of non-merchant or steel making iron was 1,603,458 tons, or a daily average for the month of 57,266 tons, compared with the daily average in January of non-merchant iron of 56,817 tons. This shows that relatively there was a higher production of both merchant and non-merchant iron in February than in January.

AVERAGE DAILY PRODUCTION.

	1910.	1909.
January	83,871	57,683
February	86,747	60,088
March	.....	$8,795
April	.....	57,687
May	.....	60,218
June	.....	64,334
July	.....	67,375
August	.....	72,021
September	.....	79,186
October	.....	84,001
November	.....	84,425
December	.....	86,539

The total number of stacks active on the last day of February was 310, compared with 311 stacks active in January. In February three stacks were blown out in Pennsylvania, and one stack in Ohio, making a total of four blown out; while in Alabama, Colorado and West Virginia, one stack was lighted in each state, making the total of three more active than in January, and making a net loss in February of one stack from the active list. The total production of spiegel in February was 19,407 tons, compared with 8,410 tons in January, or a gain for February of 10,997 tons. Of ferro the production in February was 9,085 tons, compared with 14,961 in January, or a net loss in the production of ferro in February of 5,876 tons.

FEBRUARY BLAST FURNACE REPORT.

STATES.	NO. OF STACKS. FEB.	NO. OF STACKS. JAN.	NO. IN BLAST ON LAST DAY OF MONTH. FEB.	NO. IN BLAST ON LAST DAY OF MONTH. JAN.	PERCENTAGE OF TOTAL POSSIBLE OUTPUT.	AV. DAILY CAPACITY IN BLAST LAST DAY OF MONTH.	ACTUAL TONNAGE MAKE. MERCHANT	ACTUAL TONNAGE MAKE. NON-MERCHANT.	TOTALS. FEB.	TOTALS. JAN.
Pennsylvania	156	125	128	79.2	36,562.5	270,269	729,183		999,452	1,071,808
Ohio	68	61	62	91.3	19,544.4	177,722	376,998		554,720	599,211
Alabama	46	25	24	53.7	5,495.0	110,993	41,107		152 100	170,918
Virginia	24	12	12	46.5	1,329.6	34,709	———		34,709	37,853
New York	26	19	19	72.4	5,644.9	66,111	90,498		156,609	172,228
New Jersey	9	5	5	55.5	932.0	26,102	———		26,102	28,856
Illinois	26	23	23	88.5	8,891.8	29,091	213,360		242,451	249,521
Colorado	6	4	3							
Indiana	7	7	7	78.7	5,660.6	21,350	124,351		145,702	156,605
Maryland	4	3	3							
Wisconsin	6	5	5							
Kentucky	7	1	1							
W. Virginia	4	4	3	58.6	2,509.2	41,722	27,960		69,682	68,280
Tennessee	18	12	12							
Georgia	2	0	0							
Texas	3	0	0							
Minnesota	1	1	1	44.4	675.6	18,918	———		18,918	21,344
Michigan	2	2	2							
Missouri	1	1	1							
Spiegel—All states									19,407	8,410
Ferro—All states									9,085	14,961
Total	416	310	311	73.8	87,327.0	796,987	1,603,458		2,428,937	2,599,995

SPLICE BAR MILL

Will be Erected at the Edgar Thomson Steel Works.

A. C. Dinkey, president of the Carnegie Steel Co., has advised a delegation of Braddock business men that the company will build a large splice bar shop at the Edgar Thomson steel works, Braddock, the new plant to be located along the Baltimore & Ohio railroad, between Braddock avenue and Fourteenth street. The committee called on President Dinkey as a result of reports circulated recently that the Edgar Thomson plant, which has not been operating full time for two years or more, would never again be operated in full. The new splice bar shop is to find an outlet for a portion of the steel which can be made at the Edgar Thomson plant. The United States Steel Corporation has appropriated $250,000 for the shop. Mills already at Edgar Thomson will be utilized and a finishing shop built.

BLAST FURNACE NOTES.

No. 2 Ensley stack of the Tennessee Coal, Iron & Railroad Co., which has been rebuilt, was lighted Feb. 5.

The Andrews & Hitchcock Iron Co. lighted the second Hubbard, O., stack, Feb. 25, after extensive repairs.

Riverside, W. Va., stack No. 1 of the National Tube Co., was lighted Feb. 1.

The Youngstown Sheet & Tube Co. blew out its Alice stack at Sharpsville, Pa., Feb. 18.

The Colonial Iron Co., Riddlesburg, Pa., lighted one of its two stacks, Feb. 9.

The Temple Iron Co. closed down its Temple stack at Reading, Pa., Feb. 11.

The Oriskany Ore & Iron Co. kept its Allegheny, Va., stack banked until Feb. 6.

The Punxsutawney Iron Co., Punxsutawney, Pa., blew in its stack, Feb. 11.

The Colorado Fuel & Iron Co. blew in D furnace Feb. 25, making four Minnequa stacks blowing.

Joliet stack No. 1 of the Illinois Steel Co. was blown out March 1.

FIRST STEEL MADE.

The Southern Iron & Steel Co. announces that the initial cast of 50 tons in its new open-hearth department at Gadsden, Ala., was made March 2. The rod mill is expected to start in operation about April 1.

REMODELING PLANT

Of Lawrence Furnace Co.—Wire Drawers Protest Reduction.

Ironton, O., March 7.

The Lawrence Iron Co. has begun work on the complete remodeling of the former Bird Iron Co.'s stack at Culbertson and will increase the capacity from about 100 tons to 150 tons of low phosphorus basic iron daily. The stack is being thoroughly relined and enlarged, large new stock bins built, an additional hot blast stove erected and three new batteries of boilers installed. The plant will be, when completed, an up-to-date one and the company is expecting a long period of activity when the furnace goes into blast. Mathew Addy & Co., of Cincinnati, have been appointed exclusive sales agents.

The Hanging Rock Iron Co. had a second breakout in the stack last week which was more serious than the one a few weeks ago. The accident tore down the blast pipes and necessitated a week's suspension for repairs.

The wire drawers at the plant of the Independent Steel Co., at Kenova, W. Va., went on strike last week against a proposed wage reduction of 25 per cent. The wire department is still in operation but not with a full complement of operatives.

OPERATING PLANT FOR NODULIZING.

The Central Iron & Coal Co., Holt, Ala., on Feb. 10 started operating its nodulizing plant, using pyrites cinder from the Southern Fertilizer Works, which is producing exceptionally fine nodules, high in iron and low in phosphorus. The plant is considered one of the finest of its kind in the United States, including two kilns, each 8 x 100 feet, with a maximum capacity of 150 tons each. The nodules are used in the Holt stack as raw material, taking the place of some of the ore used heretofore.

OPEN-HEARTH STEEL OF THE N. & G. TAYLOR CO.

In the daily Iron Trade Review of March 3, under the heading, "First Open-Hearth Steel," an error was made in stating that the open-hearth steel manufactured by the Maryland Steel Co. for the first time on March 2, was the first open-hearth steel manufactured in the state of Maryland.

The N. & G. Taylor Co., Philadelphia, has made open-hearth steel at its plant at Cumberland, Md., for many years. It is fully equipped for the manufacture of fine black plates, for tinning purposes. The open-hearth furnaces are run on the particular grade of steel that is required for high grade tin plates.

This company has made a study of this process for a long time. The facilities at Cumberland are also well known to drop forging and re-rolling mills which are accustomed to draw for supplies of billets from the Cumberland plant, of the special quality suitable for severe requirements.

The business on the books of the N. & G. Taylor Co. for semi-finished steel in the form of billets, sheet bars, and also tin plates of all kinds, has made it necessary for its mills to run at the utmost capacity over the past five months. The prospect for business ahead in these lines is very encouraging.

ORE CARGO LOSS WILL NOT WORK MUCH INCONVENIENCE.

Reading, Pa., March 7.

Word was received today by the Reading Iron Co. that the steamship Korea, sailing from Narvik, Sweden, for Philadelphia, and which went down about 1,300 miles northwest of Cape Race, was loaded with Swedish ore consigned to the company for use at the furnaces in this district. The cargo included about 6,000 tons and was valued at $30,000. Very little inconvenience through the loss will be experienced by the iron company. The supply of ore at the local furnaces will be shortened to some extent but not sufficiently to interfere with the output.

The Berks furnace of the E. & G. Brooke Iron Co., at Birdsboro, will be blown in the latter part of this week. It has been idle for the past two years.

BANQUET OF ELECTRICAL ENGINEERS.

Arrangements have been completed by members of the Pittsburg section of the American Institute of Electrical Engineers, for a banquet to be held at the Fort Pitt hotel, Friday evening, April 8. President, Louis B. Stilwell will talk on the work of the institute, and Charles F. Scott, a past president, will tell of the work of the local section. M. C. Rorty, general commercial superintendent of the Bell Telephone Co., will talk on "The Relation of Public Service Corporations to the Public." Dr. Walter Riddle and Dr. George C. Johnston will be among the other speakers.

FITTING OUT BOATS

Has Been Undertaken by Pittsburg Steamship Co.

The Pittsburg Steamship Co. has ordered a number of its engineers to report with their assistants at the boats and the work of fitting out is being rapidly pushed at all Lake Erie ports. Other vessel owners are following suit and it is apparent that a state of preparedness is to exist all along the line. The coarse carriers will leave port just as soon as the weather permits and the larger part of them will carry coal on their first trip.

The Great Lakes Towing Co. is making progress on the steamer Richardson, sunk outside of Buffalo harbor, and expects to raise her next week. Underwriters have already settled for this loss.

The Millen Coal Co. has been formed with a capital of $100,000 to operate a fuel dock at Sandwich.

CONTRACTS FOR BUILDING NEW PLANT.

The Cincinnati Bickford Tool Co., which recently took over the business of the Cincinnati Machine Tool Co., and the Bickford Drill & Tool Co., now located at Spring Grove avenue and Township street, contracted during the past week with the McClintic-Marshall Construction Co., of Pittsburg, for the structural steel work for its new plant at Oakley, O. Active work will be commenced on the plant as soon as the weather permits. An effort will be made to complete it ready for occupancy by October next.

BUILDING THIRD FURNACE.

Wickwire Bros., Cortland, N. Y., manufacturers of wire cloth, wire netting, wire nails, etc., advise respecting some recently noted new construction, that they are building a 35-ton open-hearth furnace to be added to their Cortland plant. The furnace will probably be in operation in something like three months, and will provide the concern with three open-hearth furnaces, the output of which is mainly for supplying its own demand for steel.

PIPE JOBBERS TO MEET.

Arrangements are being made for the annual convention of the National Association of Jobbers of Wrought Iron Pipe, to be held at the Fort Pitt hotel Mar. 14-16. Col. A. E. Ford, of Philadelphia, is president of the association. It is expected that about 200 delegates will attend.

NEW WAGE SCALE

Asked By Iron Molders of New York and Vicinity.

The conference board of the Iron Molders' union, representing twelve unions in Greater New York, Jersey City and Hoboken, has made a demand upon the foundrymen of these cities for a new wage scale, effective May 1. A minimum daily wage of $3.50 is asked. The present schedule provides a minimum of $3.00 a day for core makers and $3.50 a day for molders. The present agreement was signed on May 1, 1909, to be terminated or changed only on sixty days' notice, and the unions have complied with this latter provision. The foundrymen as yet have taken no action upon the demand.

PERSONAL.

A. S. Henry, formerly assistant secretary, has been elected a vice president of the Railway Steel Spring Co.

L. W. Francis, secretary of Witherbee, Sherman & Co., Inc., New York, has gone on a brief trip to Cuba, which will include an inspection of the iron ore operations of the island.

W. E. McFarland has resigned his connection with Parlin & Orendorfer, Canton, Ill., and has accepted the vice presidency of the Crescent Forge & Shovel Co., Havana, Ill, effective March 1.

W. R. Le Blond, formerly with Niles-Bement-Pond Co., at Pittsburg, has become associated with the Hallidie Machinery Co., Seattle, where he has charge of the machine tool department.

Gordon E. Bacon, for several years sales manager for the G. B. Lewis Co., of Watertown, Wis., has resigned to become assistant general manager of the Linderman Machine Co. of Muskegon, Mich.

H. A. Fennerty, purchasing agent of the Carnegie Steel Co., Pittsburg, was successfully operated upon for intestinal troubles at the Mercy hospital, Pittsbug, March 6. Mr. Fennerty became ill about three weeks ago.

Harry Hoover, a former well-known foundry foreman, has accepted a position with the S. Obermayer Co., manufacturers of foundry facings, supplies and equipment, and will look after the interests of the Obermayer company in Buffalo and Dunkirk, N. Y.

Louis Pyle, formerly chief order clerk at the New Castle, Pa., plant of the American Sheet & Tin Plate Co., has resigned to accept a position under the general manager of the Jones & Laughlin Steel Co.'s new tin plate plant at Aliquippa, Pa.

E. S. Kendrick has resigned the managership of the Cincinnati office of J. K. Dimmick & Co., of Philadelphia, has embarked in business on his own account and has formed Edward S. Kendrick & Co., coke and pig iron, Traction building, Cincinnati.

OBITUARY.

George C. Gill, general superintendent of the R. Hoe Co., printing press manufacturer, died at his home in Brooklyn, March 3. He was 71 years of age and had been in the employ of the Hoe company for 56 years.

Edward Pridmore, father of the late Henry E. Pridmore, of Chicago, died at his home in Batavia, Ills., on March 4, aged 80. He was a practical inventor, having been associated with the Johnson Harvester Co., of Batavia, for a number of years.

John H. Sample, aged 61, assistant engineer of the Pennsylvania lines west of Pittsburg, who assisted in preparing plans for many of the big improvements along the Fort Wayne system during the past ten years, died suddenly at the Fort Pitt Hotel, Pittsburg, March 4.

Captain Charles Jutte, aged 80 years, died March 2 in Wiesbaden, Germany, where he made his home in recent years. Mr. Jutte, in the early 80's, built two steamers which furnished the nucleus for the important coal shipping firm of E. Jutte & Co., which were later taken over by the Monongahela River Consolidated Coal & Coke Co., Pittsburg.

Thomas Giles, aged 80 years, well known among steel men, died March 6 at the home of his daughter, Mrs. William J. Boyd, Pittsburg. Mr. Giles was born in Ireland. Shortly after coming to Pittsburg, Mr. Giles became identified with the Schoenberger-Blair Steel Co., and later became connected with the Hussey Steel Co.

James C. Hill, a resident of Chicago for 57 years, and for many years in the business of manufacturing boilers, died at Rogers, Ark., March 1. At the time of his death he was superintendent of the Kroeschell Bros. Co., boiler manufacturer. For five years he was manager of the Hill-Hawkins Boiler & Tank Works. He is survived by a widow and four children.

Charles F. Aaron, until recently president of the American Supply & Machinery Manufacturers' Association, died at his home in Plainfield, N. J., March 4, following an operation. He was 43 years of age. Mr. Aaron was general sales manager of the New York Leather Belting Co., of which his father is president. He had been a very active figure in the councils of the American Supply & Machinery Manufacturers' Association and was familiar as a leader in the deliberations of the annual conventions of this organization. At the Pittsburg convention last May, he was succeeded as president by John Trix, of the American Injector Co., Detroit.

John Henry Moulton died, March 3, at his home in Ironton, O., of heart trouble, at the age of 67. Mr. Moulton had been connected with the iron and coal trades in Ironton and Cincinnati for about 45 years. He was born in Brunswick, O., but moved to Lawrence county in 1867, where he organized the Sheridan Iron Works. He was married in 1865 to Elizabeth, daughter of Hiram Campbell, himself a pioneer iron manufacturer. Mr. Moulton afterwards established the firm of Barrett & Moulton, in Cincinnati, which continued until 1875, after which he returned to Ironton and formed the company of H. Campbell & Sons, iron manufacturer.

Richard Coulter Oliphant died March 4, of grippe, at his home in Trenton, N. J., aged 58 years. He was president and general manager of the Trenton Malleable Iron Works Co. He was born Sept. 6, 1852, in Uniontown, Pa., being one of ten sons of General Samuel D. and Mary Campbell Oliphant. He was educated in the public schools and in Princeton university, and after leaving the university he went into the banking business. Next he returned to the place of his birth and was associated with his father in the operation of the Oliphant furnace properties, he having been in the fourth generation of his family to operate furnaces at Uniontown. In 1881, he joined his parents in Trenton and engaged in the pottery business and continued until their business was merged with the Trenton Potteries Co., after which he took up the business in which he was engaged at the time of his death. Mr. Oliphant was active in politics and was one of the organizers and first president of the Trenton Manufacturers' and Employers' Association.

Damaged by Fire.—The plant of M. Lanz & Sons, manufacturer of bolts, nuts, chains and mill supplies, South Side, Pittsburg, was partially destroyed by fire, March 7. The loss will not be known until an examination of the machinery is made

Stocks Maintain Recent Advances

The stock market throughout the week was fairly strong, advancing to the highest prices about mid week, and receding slightly toward the end.

Monday, about half the dealings on the exchange were in Reading and United States Steel, and the market opened weak but closed higher. Money was firmer. Tuesday, the market was dull and firm, with higher prices at the close. The annual report of the Pennsylvania railroad was influential in strengthening the market. Call loans were up as high as 3 per cent. The Lake Shore railroad declared an extra dividend of 6 per cent. The retirement of John D. Dockefeller Jr., from the directorate of the United States Steel Corporation did not affect the prices of that stock. Wednesday the market was more active, and rumors and reports of orders for railway equipment strengthened United States Steel. Money was easier. Thursday, a reaction late in the day wiped out the gains made earlier, but the general tone of the market continued cheerful. The Philadelphia strike situation did not appear to affect prices. Friday was dull with the exception of the market for copper shares. Call loans ranged from 2¾ to 3 per cent. Saturday the market was dull but firm.

Throughout the week, call money averaged from 2½ to 3 per cent. Time money was easy, and the demand was light. Clearings throughout the week were estimated at $3,593,692,943 against $2,750,203,108 for the preceding week, and $3,270,008,940 for the corresponding week the year before. The actual report of clearing house banks showed loans increased $4,970,100; deposits decreased $4,906,000; surplus decreased $9,370,875, and the ratio of reserve 25, against 26.7 the week before. Trust companies and non-member banks showed loans and investments increased $1,452,700; total deposits increased $1,609,200; the percentage of reserve 17.5 unchanged. Exports of gold from New York were $1,161,655, of which $970,000 were shipped to Havana and $150,000 to Chistobal. Imports of gold for the week were $1,165,426, of which $965,000 came from France. Failures for the week numbered 251, against 221 the week before, and 283 the corresponding week of last year. Statistics compiled by the *Financial Chronicle* show that the gross earnings of railroads for the calender year in 1909 increased $279,070,031, or 12 per cent over the year before, while the net earnings showed a gain of $146,859,166 or 19½ per cent. The number of shares of stock sold on the New York exchange was 3,116,400, against 2,139,400 the week before and 3,066,600 the corresponding week of the year before. Bonds, other than government bonds were sold to the value of $13,251,000, against $11,771,000 the week before, and $16,764,000 the corresponding week the year before. Sales of stock for the month of February were the smallest since last July. The dealings in bonds for the month were less than in any month since June, 1908.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Mar. 5	Changes in week	Ann. M't'g. Date 1910	Stock Outstanding	Basis	Dividend: Last Dividend	Dividend: Date Last Div. Pay.
Allis-Chalmers	12	.....		$19,820,000		.....	.....
Allis-Chalmers, pr	43	+2		16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	12⅛	+ ⅝	Feb. 2	41,233,300		1¾ Q.	.....
American Can, pr	77½	+2¼		41,233.300	7 cum.	.....	Apr., 1910
Am. Car & Fdy	65¼	+2¼	June 24	30,000,000		½ Q.	Apr., 1910
Am. Car & Fdy., pr	119	+ ¼		30,000,000	7 n. c.	1¾ Q.	Apr., 1910
American Loc	54¼	+3¾	Oct. 18	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	112½	+1		25,000,000	7 cum.	1¾ Q.	Jan., 1910
Am. Ship	74½	.....	Oct. 12	7,600,000	4	1 Q.	Mar., 1910
American Ship, pr	111½	.....		7,900,000	7 cum.	1¾ Q.	Jan., 1910
Am. Steel Foundries(new)	62¼	+1¼	Dec. 1	17,184,000		1¾ Q.	.....
Barney & Smith	30	.....	June 7	2,000,000	4	.....	Sept., 1907
Barney & Smith, pr	90	.....		2,500,000	8 cum.	1 Q.	June, 1908
Bethlehem Steel	31	+1	April 5	14,862 000		.....	.....
Bethlehem Steel, pr	64	+4		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	48⅞	— ⅛	Mar. 15	45,000,000	5	2½ S. A.	Feb., 1910
Cambria Iron	47	.....		8,468 000*	4	2 S. A.	Apr., 1910
Chicago Pneumatic Tool	44½	—1¼	Feb. 21	6,145,000	4	1 Q.	Apr., 1910
Colorado Fuel	41¾	+2⅜	Oct. 17	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	16	+ ¾	Oct. 19	24,578,400		3½.	.....
Crucible Steel, pr	91	+3		24,436,000	7 cum.	1¾ Q.	Dec., 1909
Empire Steel	13	.....	Feb. 23	1,254,770		.....	.....
Empire Steel, pr	80	.....		2,500 000	6 cum.	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb. 15	1,000,000	7	3 S. A.	Feb., 1910
Fay & Egan, pr	120	.....		1.000.000	7 cum.	1¾ Q.	Nov., 1909
General Electric	155	.....	May 10	65,179,600	8	2 Q.	Apr., 1910
Harbison-Walker	35½	.....	Jan. 17	18,000,000		2 Q.	Oct., 1907
Harbison-Walker, pr	94	.....		9,600,000	6 cum.	1½.	Oct., 1909
International Pump	48⅛	— ½	May 10	17,762,500		1 Q.	Apr., 1905
International Pump, pr	88	.....		11,350,000	6 cum.	1½ Q.	Feb., 1910
Lackawanna Steel	50	.....	Mar. 9	34,978,000		.....	.....
Lake Sup. Corp	24½	+ ¼	Oct. 5	40,000 000		.....	.....
New York Air Brake	81¼	+5¼	June 16	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	101	.....	Feb. 2	8,500,000	6	1½ Q.	Mar., 1910
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Feb., 1910
Otis Elevator Co	52	+1	Mar. 21	6,375,300	3	1½ S. A.	Oct., 1909
Otis Elevator Co., pr	99	— ½		6,295,000	6 n. c.	1½ Q.	Jan., 1910
Pa. Steel	65	.....	May 9	10,750,000		.....	.....
Pa. Steel, pr	112½	—1		16,500,000	7 n. c.	3½ S. A.	Nov., 1909
Pittsburg Coal Co	21¾	+1¼	Mar. 8	28,104,600		.....	.....
Pittsburg Coal Co., pr	74¼	+2⅛		27,071.800	7 cum.	1¾ Q.	Jan., 1910
Pressel Steel Car	44¾	+2¼	Feb. 16	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	102¾	+1½		12,500,000	7 n. c.	1¾ Q.	Feb., 1910
Pullman	195½	— ½	Nov. 9	100,000,000	8	2 Q.	Feb., 1910
Railway Stl. Spring	44	+2⅜	Mar. 3	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	105	+4		13,500,000	7 cum.	1¾ Q.	Mar., 1910
Rep. Iron & Steel	40	+2	Oct. 19	27,191,000		.....	.....
Rep. Iron & Steel, pr	102¾	+1¼		20,416,900	7 cum.	1¾ Q.	Apr., 1910
Sloss Sheffield	77½	+1	Mar. 9	10,000,000	5	2 Q. †	Feb., 1910
Sloss-Sheffield. pr	118	+1⅞		6,700 000	7 n. c.	1¾ Q.	Jan., 1910
U. S. Pipe & Fdy. Co	26½	+2	June 22	12,106,300	2	1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	78	.....		12,106,300	7 n. c.	1¾ Q.	Mar., 1910
U. S. Steel	85⅝	+4⅞	April 18	508,302,500	4 n. c.	1¾‡ Q.	Mar., 1910
U. S. Steel, pr	121⅛	+1¼		360,281,100	7 cum.	1¾ Q.	Feb., 1910
U. S. Steel, 5s	105¼	.....		463,798,000	5	.....	.....
Va. Iron, Coal & Coke	62¾	.....	Sept. 20	9,073,680		.....	.....
Westinghouse Elec	73¼	+2¼	July 27	27,173,200*		1¾ Q.	Oct., 1909
Westinghouse Air Brake	147	+2	Oct. 4	14,000,000*		4 Q.	Oct., 1909

†Includes deferred dividend of ¼ of 1 per cent.
Par value of shares, $100, except those starred (*), $50.
‡Includes ¼ per cent extra.

Copper Stocks.

New York.—Amalgamated Copper closed 81⅞, an increase of 5¾.

Boston.—Butte Coalition closed 26, an increase of 1¼; Calumet & Arizona closed 73½, a decrease of ¾; Calumet & Hecla closed 635, a decrease of 5; North Butte Mining closed 39¼, an increase of 1⅝; Quincy Mining closed 88, no change.

Financial Notes.

The American Smelting & Refining Co. has declared the regular quarterly dividends of 1¾ per cent on preferred stock, payable April 1; and 1 per cent on common, payable April 15.

The directors of the United States Steel Corporation have called the annual meeting of stockholders to be held at Hoboken, April 18. It is expected that the meeting will be without important developments.

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March, 1909	5,396
April	5,508
May	5,533
June	5,551
July	5,572
August	5,597
September	5,609
October	5,628
November	5,634
December	5,662
January, 1910	5.681
February	5,703

March 10, 1910

FRANCE ALONE MAY EXPERIENCE MAXIMUM TARIFF.

The negotiations by the officials of the United States and the representatives of foreign governments regarding the minimum tariffs which are sought to be secured for this and other countries as an amicable adjustment of customs matters, have proceeded to such an extent that the indications now are that France will be the most stubborn country to deal with in the closing hours of the negotiations. It would not much surprise the officials of this government if the enforcement of maximum duties by this country and France were the final outcome of the present differences.

Attention has been called to the fact that the final draft of France's tariff is now pending in the senate of the legislative body of that country. It has been supposed that with the French government having its tariff matters so well in hand it would be possible to bring about such adjustments as to secure the lowest possible rates of their tariff in exchange for the minimum rates of the United States tariff. It appears, however, that some serious obstructions have arisen to this amicable adjustment. France seems not to be concerned over the fact that Germany and all the important commercial countries of continental Europe have exchanged minimum rates for the minimum rates of United States tariff. The latest advices are that some of the rates of the French tariff as it stands are strongly objected to by our officials because those rates are regarded as especially discriminating against the American products. In some cases, the French minimum rates have been doubled under the final draft of the tariff of that country. The answer of the French government to the protestations of our officials, is that we have no right to complain, in view of the exhorbitant duties charged against French wines by our tariff.

One of the striking instances in the negotiations now in progress is the rate of duty imposed by the French tariff on American cotton seed oil. France buys about 90 per cent of her imports of cotton seed oil from this country. She retorts to our objections to her increased rates that practically all of the American imports of champagne come from France, and yet we have raised our minimum rates on champagne by the last tariff revision bill.

There are indications that some of our officials would regard it as not altogether unfortunate if the negotiations with France were to result in the enforcement of our maximum rates against that country, although such action would enforce against us the maximum rates of French tariff. The maximum rates of the French tariff are now enforced against our exports to that country. This situation will continue unless the negotiations now in progress shall be completed upon an exchange of minimum duties before the close of the present month.

This situation with reference to our trade with France, and our negotiations with Canada, constitute the most important foreign trade issues now pending under the maximum and minimum section of our new tariff. There is no change in the Canadian situation, and this government has sent to Ottawa Chairman Emery of the tariff board, and Mr. Pepper of the bureau of foreign trade relations, to complete negotiations with the Canadian authorities. While it is too early to reach a definite conclusion as to the probable outcome of the conferences with Canada, the officials in Washington express the belief that the result will be favorable to both countries. Thus it is that with the exception of France and several of the South American countries which have both seaboard and internal duties, or what amounts to double systems of customs tax levies, the important negotiations with foreign governments over these minimum tariffs are nearing completion.

The fact that the enforcement of maximum rates between this country and France is regarded as not altogether improbable, is shown by the fact that already consideration is being given by our officials to the possible effect upon American trade import and export with France, if the enforcement of maximum tariffs shall be found necessary. Our officials believe that the United States will have the better of it. They base this conclusion upon the fact that the greater part of our exports to France already have the advantage of free importation, as they are raw materials required by French manufacturers. On the other hand, French exports to our markets are, in the main, high class luxuries which pay heavy duties and probably would not feel the added burden of maximum rates. This is

true as to French wines, fancy laces, gloves, etc. The point is also made that if France insists upon maximum rates, rather than make such concessions as our officials deem necessary, the probability is that Italy, Germany, and Austria will take prompt steps for placing on our markets these articles of luxury that are now in a large part supplied by France.

THE DECREASED PRODUCTION OF BESSEMER STEEL.

The pig iron statictics recently presented by the American Iron and Steel Association showed a decrease of 2,674,250 tons in the production of Bessemer and low phosphorus pig iron from 1907 to 1909, despite the fact that production of all grades increased 14,110 tons. The statistics of Bessemer steel production in 1909 are not yet available, but following established proportions, the decrease in Bessemer pig iron would indicate a decrease in Bessemer steel of some 3,350,000 tons, or to between 8,300,000 and 8,350,000 tons.

The rail statistics for 1909, which were commented upon in these columns a week ago, showed that from 1907 to 1909 the production of open-hearth rails increased by almost exactly one million tons, to 1,255,961 tons. The production of Bessemer steel rails decreased 2,127,184 tons, to 1,252,841 tons. Thus, should the decline in Bessemer steel from 1907 to 1909 prove to be about 3,350,000 tons, very nearly two-thirds of the decrease has been in the single item of rails. There has doubtless also been a decrease in Bessemer steel plates and shapes, of which no separate statistics are gathered. Open-hearth plates are now specified almost universally, while the tonnage of Bessemer structural shapes has become very small.

BRITISH IRON TO MAINE.

Pig iron is featureless, but prices do not yield, despite the slackness of demand, both from consumer and speculator, says The Ironmonger, London, Feb. 26. The market, however, looks pretty firm in London at all events, whatever be the case in Glasgow. No serious drop in prices is considered possible. The steamship Jacona has been chartered to load 2,000 to 3,000 tons of No. 3 at Middlesbrough for Portland, Me.

CORPORATION TAX

Is Much Needed—Payne Law Receipts Satisfactory.

Office of THE IRON TRADE REVIEW,
Post Bldg., Washingon, D. C., Mar. 7.

Interest among the officials of the treasury department is developing rapidly at this time in the possible and probable outcome of the corporation tax law. Keeping constantly in mind, as the officials do, the possibility that this new law may be declared unconstitutional in a test case before the Supreme court of the United States, they are building hopefully upon the law being upheld and the receipts from the new tax coming in handsomely to relieve the more or less straitened conditions of the public finance.

It has been the estimate of the treasury officials, as it was of the committees of congress, the estimates of the latter being based very largely upon what facts were furnished them by the treasury department, that the receipts from the corporation tax would aggregate approximately $25,000,000 a year. The importance of the receipt by the treasury of about $25,000,000 or upwards during the present year, will be manifest to all who take notice of the conditions of the public finances at this time. There has not been a time in the recent history of the government when the treasury was run upon such scant daily balances and working funds, or even the aggregate deposited by the government in the national bank depositories.

An effort is being made by the treasury officials at this time to avoid the necessity for an issue of Panama bonds or the proposed certificates of indebtedness. At the present time, the general fund in the treasury is about $105,000,000, and the working balance is about $20,000,000. The time was, not very long ago, when it was regarded by the officials of the department as impolitic to maintain a working balance of less than $50,000,000. In order to maintain anything like the former working balance, it has been necessary for the treasury to withdraw a considerable amount of the funds that have been on deposit in the national banks. These depositary banks now hold less than $40,000,000 of the public funds, so that it will be seen that comparatively little more can be withdrawn from these sources to hold up the necessary working balance of the treasury.

From the revenue standpoint, the new tariff law is working satisfactorily to the treasury officials. The daily receipts at this time are running constantly above the ordinary expenditures. It is only when extraordinary outgoes take place, from time to time, that the working balance is drawn down to a dangerous line, and threatens further withdrawals of funds from the banks.

With the revenue laws thus bringing to the treasury an excess of funds above the ordinary expenditures, the treasury officials are confident that even the extra expenses due to the Panama canal operations will not force an issue of canal bonds, or even of certificates of indebtedness or the proposed 3 per cent bonds, if the corporation tax law shall be upheld and the revenues from that source shall run approximately to the amount anticipated to come from that source. The entire public finances are still complicated by the situation with respect to financial regulations expected to come from congress within a reasonable time. Thus it has been that even the postal savings bank law and all discussions of bond issues have turned to some extent upon the prospect that the congressional monetary commission will present to congress a plan for a general reorganization of the public moneys and banking.

The present situation, however, is largely dependent upon the successful working and the upholding of the corporation tax law.

HOW ZINC AND LEAD ORES ARE PURCHASED.

In the Joplin district, all zinc ores are purchased on the basis of the ore containing 60 per cent metal. For such ore a standard bid is made. If the ore on analysis proves to contain 61, 62 or more per cent of metal, a dollar per ton is added to the basis price for every per cent more than 60 per cent. If the analysis shows the ore to contain less than the standard of 60 per cent, the dollar per ton is deducted from the standard bid. These rules apply to the zinc-blende ores. For the calamine ores, which are the silicates of zinc, the basis is 40 per cent of metal and the dollar per unit up or down prevails as on the zinc-blende or sulphide of zinc ores.

Lead ores are purchased in two ways, on flat bids, no matter what the ore contains in metal, and upon the basis of 80 per cent metal and here, too, the unit of metal content up or down prevails. There is no penalty for iron content in lead ores, but there is a penalty of $1 per unit of iron content above 1 per cent in all zinc ores.

ANNUAL MEETINGS OF THE N. M. T. A. LOCAL BRANCHES

A number of local branches of the National Metal Trades Association held their annual meetings last week, including the branches at Boston, Cincinnati, Cleveland, Providence, and Worcester, Mass. The attendance at these meetings was both large and enthusiastic. One of the subjects which came up for general discussion was the plan being put into effect by the Cincinnati branch to establish a "continuation school," by means of which lads anxious to learn the machinist's trade are permitted to work part of the time in the shops, and attend general classes in the public school, the time devoted to the latter being paid for by the employing company. This plan follows in its general scheme that so successfully established by Prof. Schneider.

The annual meeting of the New York-New Jersey branch, was held Monday evening; the New Haven, Conn., branch held its meeting Tuesday night; the Indianapolis branch will hold its meeting March 11; and the St. Louis branch, March 15.

Reports from these various meetings augur well for a large attendance at the next national convention of the National Metal Trades Association, which will be held April 13 and 14 at the Hotel Astor, New York City. This convention will be preceded by meetings of the national council of administration, which will be held at the Hotel Astor, April 11 and 12. The annual banquet will be held at the same place on the evening of April 13.

The Cleveland Branch.

The annual meeting of the Cleveland branch of the National Metal Trades Association, held Thursday evening, March 3, at the Cleveland Athletic club, was one of the most enthusiastic and best attended meetings of the branch in years. The report of President L. D. Wiening was read by Vice President Bruce ,and Secretary Phil Frankel presented his report, both showing that the membership had increased in the past year and that the branch is in good shape financially. Ex-Governor Myron T. Herrick of Cleveland delivered an address on national politics from the viewpoint of the average businessman, taking the position that the national administration was endeavoring to do whatever lay in its power to restore confidence and accomplish those things that make for the permanent prosperity of the nation. Howard P. Ellis, of Cleveland, president of the National Metal Trades Association, spoke of the aims of the association, calling attention to the excellent results accomplished in the past year and asking the members of the Cleveland branch to respond heartily and patriotically when the possible assessment is levied which has for its object the accumulation of a quarter of a million dollars for a defense fund. Rev. G. Frederick Williams, pastor of the Church of the Ascension at Lakewood, O., delivered an address expository of proposed state and national legislation, and also called attention to the real needs of employes as voiced by conservative labor organizations. Attorney J. P. Dawley spoke on proposed state and national legislation, the corporation tax, the woman's 8-hour bill, and the evils of blacklisting as a set-off by employers to labor organizations' equally brutal boycott. The following officers were elected: President, C. O. Bartlett, of the C. O. Bartlett & Snow Co.; vice president, F. R. White, of the Baker Motor Vehicle Co.; treasurer, C. J. Snow, of the Bruce-Macbeth Engine Co.; executive committee: James Fostor, of the Hydraulic Pressed Steel Co.; George Dunham, of the Royal Tourist Car Co.; Walter D. Sayle, of the Cleveland Punch & Shear Works Co.; P. P. Robbins, of the Cleveland Hardware Co., and J. H. Champ, of the Bishop & Babcock Co.

The Boston Branch.

Boston, Mass., March 9.—The annual meeting of the Boston branch of the first district, National Metal Trades Association, was held Wednesday night at Youngs Hotel, this city. The meeting held at 5:45 p. m., was followed at 6:30 by the annual dinner and speechmaking. These officers were elected: President, E. P. Robinson of the Atlantic Works, East Boston; vice president, Winslow Blanchard, of the Blanchard Machine Co., Cambridgeport; treasurer, Duncan D. Russell, of the James Russell Boiler Works, South Boston; executive committee to serve until 1911, Frederick F. Stockwell, of the Barber, Stockwell Co., Cambridge; to serve until 1912. M. B. McLauthlin of the George T. McLauthlin Co., Boston. The other members of the committee whose term has not expired are: H. I. Illingsworth, of the Boston Machine Works Co., Lynn, Mass., and George F. Lawley, of the George Lawley & Son Shipbuilding Co., South Boston. M. H. Barker, of the American Tool & Machine Co., Boston, was elected honorary member of the branch's executive committee.

The secretary is to be appointed, D. F. S. Clark, the present incumbent, being practically settled upon to succeed himself. The reports of the retiring treasurer, D. D. Russell, showing the branch to be in an unusually flourishing condition, and that of the secretary, Mr. Clark, were read and accepted. There was an excellent attendance and considerable enthusiasm was displayed.

The speakers of the evening were Henry C. Long of Boston on the subject, "The Industrial Development of Boston;" Charles L. Hildreth of the Whitcomb, Blaisdell Machine Co., of Worcester, Mass., and Robert Wuest, of Cleveland, commissioner of the National Metal Trades Association. Mr. Wuest spoke briefly, complimenting the branch on its success but urging greater efforts to increase the membership. Mr. Hildreth read a paper illustrated by lantern slides, on the outing last summer of the Branch at Worcester. Numerous photographs recalling many of the happy events of the day won general approbation.

Mr. Long's address was a serious exposition of the lack of proper and modern freight handling methods for Boston, illustrative of the causes why, as he said, Boston manufacturers pay three to five times as high rates, and take from three to five times as much time to move their shipments in the city of Boston as any city in the world. The average price per ton for handling freight in Boston, he said, was 35 cents while in Liverpool it was 3 to 4 cents. Boston was 40 years behind the times in her internal railroad transportation.

The Cincinnati Branch.

Cincinnati, March 7.

The annual meeting and dinner of the Cincinnati branch of the National Metal Trades Association, was held at the Business Men's Club, Thursday evening, March 3. Secretary J. M. Manley reviewed the events of the year in detail, and in closing said: "The work of the year has been further to develop and strengthen the policy of co-operation and a better understanding of our neighbors and competitors has been planned and was

signally successful. In evidence I would cite an increase of membership of 50 per cent over that of four years ago, the co-operative force in engineering, the continuation school and an increase of 40 per cent of the number of apprentices employed in 1908. Through the earnest persistent work of determined men, the first continuation school in America was started Sept. 1, a logical and natural outgrowth of Prof. Schneider's course in engineering. This movement is considered by all who have studied the situation as the most important step so far taken in this country in the training of industrial workmen."

Pres. J. W. Neill, of the John H. McGowan Co., in his annual report commended the association on the work done during the past year, conditions showing that nearly all of the members of the association were enlarging building areas, increasing the number of tools as well as the number of operators. George K. Elliott, of the Lunkenheimer Co, followed with an illustrated lecture on "The Structure and Adaptability of the Iron Alloys" which was a decided treat to the members. The next speaker was J. H. Renshaw, who made clear the relation of the continuation school to the tax payers, contending that the one half day each week, on which the manufacturer permits an apprentice to attend school without loss of pay, was neither charitable, or philanthropic, but a strictly business proposition. The next speaker was Stanley Bowdle, whose topic was "The Mechanical Advance in America." B. B. Quillen, C. Wood Walter, and several representatives from Boston, Mass., New York, Muncie, Ind., and Lima, O., made short addresses. The association unanimously decided to give again the outing during the summer to employes. The following officers were elected to serve during the year:

President, R. K. LeBlond of the R. K. LeBlond Machine Tool Co.; vice president, E. H. Hargrave of the Cincinnati Tool Co.; secretary, R. S. Alter of the American Tool Works Co.; Treasurer, Henry Ritter of The Lunkenheimer Co. Executive committee: P. O. Geier of the Cincinnati Milling Machine Co.; S. P. Egan of The J. A. Fay & Egan Co.; B. B. Quillen of the Cincinnati Planer Co.

Worcester, Mass., Branch.

Worcester, Mass., March 7.

The annual meeting of the Worcester branch of the National Metal Trades Association was held Friday night at the Bay State house in this city when the annual dinner was also held, Charles E. Hildreth, the retiring president, was in the chair and reports by the secretary and treasurer were read and accepted.

These officers were elected: President A. E. Newton; vice-president John W. Higgins; treasurer C. W. Hobbs; executive committee for two years, George I Alden and George F. Brooks; for one year, A. W. Whitcomb.

National Commissioner Robert Wuest of Cleveland, made an appeal for the "continuation school" as carried out in Cincinnati. This plan, which was heartily indorsed by the Worcester branch, consists in permitting boys to spend one-half day in the machine shop learning the trade, and the other half in school getting a general education, manufacturers helping to pay the expenses and thus securing competent help in the end.

MINING ENGINEERS

Listen to Eulogies, Discuss Papers and Witness Tests.

The ninety-eighth annual meeting of the American Institute of Mining Engineers was held in Pittsburg March 1-4 inclusive. At the opening session Tuesday evening, in Carnegie Institute, Dr. John A. Brashear made the address of welcome. D. W. Brunton, of Denver, president of the Institute, responded. Colonel H. P. Bope, Pittsburg, read a eulogy on the late William Metcalf and Dr. R. W. Raymond, of New York, read a biographical notice of Dr. Charles B. Dudley. Robert H. Richards, of Boston, read a paper on "The Development of Hindered Settling Apparatus." During the course of a talk on "Mining Districts of Argentine," by Z. S. Beyl, lantern slides showed the ore mines of the Argentine republic.

The second session was held Wednesday morning, when the topics relating to coal mining were discussed.

During the afternoon, the delegates witnessed a number of tests at the United States Geological Survey Testing Station at Arsenal Park. The most important test of the day was a demonstration of the affect after an explosion of a permissible powder, and also that which is not allowed under Pennsylvania regulations, the black powder. At the third session, the following papers were read and discussed: "Accumulation of Petroleum in the Earth," by David T. Day, Washington, D. C.; "New Method of Cyaniding Gold and Silver Ores," by E. Gybbon Spillsbury, New York; "Theoretical Consideration of Combustion in Burning Cement," by Byron E. Eldred, Tuckahoe, N. Y.; "Introduction of Basic Steel Process in the United States," by George W. Maynard, New York.

Thursday the delegates made a trip through the Monongahela valley, stopping at the Homestead works of the Carnegie Steel Co. and other industrial plants. The final session was held at Carnegie lecture Hall Friday morning, continuing until late in the afternoon.

BETTER CAR INQUIRY

Is Noted and Some Important Awards Made—Large Harriman Inquiry.

New York, March 5.

More substantial evidence of the changing attitude of the railroads toward car buying is being manifested in the market. Some important new inquiries and several contracts of considerable size were placed with car builders the past week and there are forerunners in sight to indicate that some large additional business will shortly appear.

The most important development of the week was the appearance in the market of the Harriman lines for a large lot of freight cars, 5,505 in all, to supplement their large coach inquiry reported last week. The assortment of freight cars includes 1,500 box, 1,000 automobile, 1,000 stock, 1,000 flat, 800 steel gondolas, 150 steel hoppers and 55 cabooses. All the cars are of steel underframe construction with the exception of the cabooses. Proposals on this lot are being taken and an award is expected next week. The Chesapeake & Ohio is also inquiring for 1,500 hoppers and 500 box cars and the National lines of Mexico for 400 box, flat and gondola cars. Swift & Co. are in the market for 100 tank cars.

The report that the Hill lines have placed 4,000 freight cars with Haskell & Barker is confirmed. Of this assortment 2,500 cars will go to the Chicago, Burlington & Quincy. Other large expenditures for cars will be made by the Hill lines shortly and the Burlington is now in the market for 1,000 steel gondolas.

Action on the Southern Railway's inquiry for 3,000 gondolas, 500 coke and 100 box cars, is scheduled to take place next week. In addition to the award of this lot to private builders, the Southern Railway will build 2,600 freight cars for itself in the Lenor shops.

AMONG MACHINERY MAKERS.

PITTSBURG.

Large Volume of New Business Coming in—Power for Minnesota Steel Co.

Office of THE IRON TRADE REVIEW, 510 Park Building, Mar. 8.

Machinery makers of Pittsburg report that there is a large volume of new business coming in, and that their plants are now operating full time on large contracts placed some time ago. Recently it was reported that on account of a temporary lull in general business conditions some contracts for machinery had been cancelled. Investigation shows that these reports are without foundation. Makers state that instead of orders being cancelled, new business is coming in at a fairly lively rate, and the indications are that additional contracts will be placed shortly, as there is a large volume of new business in sight.

The C. & G. Cooper Co., of Mt. Vernon, O., has received a contract from the Minnesota Steel Co., Duluth, Minn., for a complete electrical unit of 750 horsepower capacity. This equipment includes a cross compound Corliss engine and a 500-kilowatt direct-current generator, which will run 100 revolutions per minute. This unit will furnish the current required for the construction work which will be carried forward at the Minnesota Steel Co.'s works this spring, and will be the initial power installation on the property of this company, which is a subsidiary of the United States Steel Corporation.

The works of the Union Switch & Signal Co., Swissvale, Pa., are now operating at high pressure, 100 per cent more men being employed at present than a year ago. Since the first of the year sales have been above the average and are considerably in excess of the same period last year. Indications for March are decidedly encouraging, and the first quarter of the present fiscal year will compare favorably with any similar period in the company's history. The company recently installed additional facilities at the Swissvale shops.

Application for a charter is being made by the New Castle Iron & Steel Co. The incorporators are Charles J. Kirk, E. W. Beadel, Thomas F. Morehead, R. C. Patterson and W. H. Cox. The object of the company, as set forth in the application for the charter, is "to buy and sell iron, steel and other metals, and the manufactured products of iron, steel and other metals."

Van Horn Ely, of Steubenville, O., president of the East Liverpool Traction & Light Co., East Liverpool, O., has purchased the property of the Valley Electric Co., New Brighton, Pa., valued at $300,000. The Valley Electric Co. operates the Beaver Valley Electric Light Co. and the Rochester Electric Co., supplying every borough in Beaver valley. It is expected that additional machinery will be installed.

It is understood that the Frazer Lock Bar Pipe Co., incorporated several months ago, will erect a new plant in the Sharon, Pa., district. Plans for the new works were published some time ago.

The Stauffer-Connellsville Coke Co., Greensburg, Pa., has been chartered with a capital stock of $100,000. The incorporators are: Jesse A. Stauffer, William Waugman, Scottdale, Pa.; L. C. Thomas, Latrobe, Pa.; J. N. Bucher, Samuel Cummings and M. E. Frazee, Connellsville, Pa. Other coke companies chartered recently, which are making arrangements to take up development work, are the Scottdale Coal & Coke Co., Scottdale, Pa., capital $50,000, and the Righter Coal & Coke Co., Clarksburg, W. Va., capital $250,000.

The Nanty-Glo Coal Mining Co. will expend $50,000 for electric haulage and mining machines in its plant near Nanty-Glo, Pa.

The Diamond Forge & Mfg. Co. has been organized with a capital of $50,000. A. M. Deihl, Pittsburg, is treasurer. The directors are W. H. Foster, D. R. Wilson and A. M. Deihl, all of Pittsburg. The Star Steel Co. has been granted a charter with the following directors: H. A. Ross, C. C. Morrison, Pittsburg, Pa., and F. H. Morse, Cleveland, O.

The capital stock of the Heppenstall Forge & Knife Co., Pittsburg, which recently took over the property of the Velte Foundry & Machine Co., Pittsburg, and which is making extensive improvements to its plant, has been increased from $150,000 to $300,000.

Plans have been prepared by the Dilworth Coal Co., Pittsburg, for the erection of a coking plant at Rice's Landing, Pa., that is to embrace 200 ovens. Work is to be started as soon as weather conditions permit.

The contract for the Norfolk & Western Railway Co.'s Cedar Bluff, W. Va., tunnel has been awarded to the Franklin Contracting Co. The tunnel will be 4,700 feet long. An immense fan will be installed in the tunnel.

President Robert M. Russell, of Westminster College, New Castle, Pa., announces that a new electric line is to be built between New Castle and Sharon and other points. The company will be financed by J. G. White & Co., New York, and the concern will be capitalized at $1,000,000. Plans are now being prepared for the power plant and necessary rolling stock.

The secretary of state, West Virginia, has issued a charter to the Fairmont & Pittsburg Railway Co., with a capital stock of $1,000,000, to construct an electric line from Fairmont, W. Va., to Pittsburg, Pa., with a number of branch lines. The incorporators are: William F. Laws, Jersey City, N. J.; H. F. Smith, J. R. Linn, S. E. Miller, Fairmont; J. F. Beatty, Mannington, W. Va.

The Baltimore & Ohio Railroad Co. has made formal application to the secretary of war for the use of a strip of the government pier at Lorain, O., for new ore-handling machinery to be installed. The company proposes to expend $1,000,000 for dock improvements at the mouth of Black river. Several of the railroads are making inquiry for machinery and shop tools, and it is expected that some large orders will be awarded shortly.

NEW YORK.

Large Railroad Lists Expected Soon—Good Current Tool Demand.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Mar. 8.

Although no additional railroad lists of large size have made their appearance in the machine tool market the past week, all signs point to some important developments along this line in the near future. The New York Central lines which have been quietly sounding the situation for some time, are believed to be upon the verge of inquiring for a large list and this lot, it is thought will come out sometime during this month. There are also indications at hand that lead to the expectation that the Pennsylvania railroad will be a large purchaser before many weeks.

With gradually improved prospects of buying upon the part of the railroads and with a very satisfactory condition of trade from other classes of industry and from the smaller shops, the general situation in the

market is one of gratifying strength and promise to builders. Some of the heavier lines of tools are not moving as freely as the medium sized and smaller designs but the tendency of the market is towards a broader demand in which the former are getting some benefit. The medium sized tools have enjoyed a strong demand and this is being sustained in a very satisfactory manner. Some of the leading New York houses making a speciality of these tools report that their February business was the largest of any corresponding month in their entire history. March for these sellers has started off in an auspicious manner and a large volume of trading is expected as the month is usually an active one in ordering. The demand for tools from the automobile makers and allied plants which has been one of the striking characteristics of the market is now about at the fag end of the season, but this trade is expected to be resumed in a few months time. The western automobile builders have been the most prominent in this buying and only a moderate amount of this business has been booked from New England.

Deliveries on some classes of tools are still far behind, principally in those lines in which the automobile buying has been strongest. So busily engaged have some sellers been with the current live inquiry and projects ready for closing that they have been giving comparatively little attention to new shop construction prospects in their preliminary stage, which is in striking contrast to the attentive manner in which these were followed up about a year ago. From all reports the single tool and small installation inquiry continues very good.

The International Steam Pump Co. continues to be a buyer of some importance in the market but it is only closing for its regular needs and is putting out no large lists.

The Edison Electric Illuminating Co., 360 Pearl street, Brooklyn, is planning a large expenditure for improvements upon its Pearl street plant. W. F. Wells is general superintendent.

The Adams Electric Co. of Trenton, N. J., has been awarded the contract to furnish and install seven electric motors, including wiring, belting, repairs, etc., in the New Jersey state prison.

The James White Power Co., Athens, Ga. has been formed by James White, owner of the Star Thread Mills, for the construction of a hydro-electric plant at Barnett Shoals. About 4,000 horsepower will be developed and electricity generated to be transmitted for manufacturing and lighting. About $250,000 will be expended. The principal consumer of the power will be the Star Thread Mills. Contracts have been awarded for the construction of the power dam. The general report is that other cotton mill enterprises of the vicinity may follow the completion of this water power-electrical development.

It is reported from Boston that the Commonwealth Real Estate Co. of that city is planning the establishment of a new cement industry at Brockton Heights for the manufacture of bricks, sanitary fixtures, etc., from crushed granite. A crushing plant and other manufacturing departments are to be established.

Plans have been prepared for the enlargement of the power house of the Stanley Electric Mfg. Co., Pittsfield, Mass. It is planned to double the capacity of the plant and the construction with the machinery to be installed will represent an outlay of about $50,000.

Two New England power house projects which will call for considerable equipment are those of H. C. Woods & Co. and Weber Bros. both of North Adams, Mass. The Woods company has already awarded the contract for an addition to its present plant while Weber Bros. have their plans in the preparatory stage. The Lowe Mfg. Co., Huntsville, Ala., has made plans for the equipping of a power house to run its manufacturing plant by electricity.

Definite action as to the form of contract and the specifications for the first section of the extensive subway plans in New York and Brooklyn are expected to be ready about April 1 as the conferences of the Public Service commission and other city officials have progressed to the point that immediate action is expected. The officials are anxious to make a start as soon as possible upon the Broadway-Lexington subway in New York and upon the Broadway-Lexington route in Brooklyn and the city's financial affairs have been arranged for a large expenditure upon these projects immediately. The ultimate cost of the extensions will probably be in the neighborhood of $100,000,000 but it is proposed to carry this work over a term of years and to advance the construction in sections, expending about $20,000,000 to $25,000,000 annually. The building of the new subways will provide a large demand for machinery of all kinds by the contractors, as was the case when the present construction was done.

CINCINNATI.

Tone of Market Is Cheerful Though New Bookings Are Not Numerous.

Office of THE IRON TRADE REVIEW,
N. E. cor. Fourth and Elm Sts., Mar. 8.

The past week in machinery circles has developed a lighter and more cheerful tone, not so much perhaps, from actual new business that has come forward, but with the coming of spring, a reaction, possibly largely sentimental, has made itself manifest, and machine tool builders in harmony with others have responded to its influence. Shops are as busy as ever on delayed shipments, and while new bookings are far below what could reasonably be expected or desired, are sufficient to keep them running at a normal pressure, far into the summer months.

From all quarters comes the cry of a scarcity of good machinists, and as a consequence the output of the various factories is very materially lessened. The demand continues along the line of smaller tools, and while there are occasional calls for heavier tools, the production is far below normal. The demand for woodworking machinery is a little more active, and builders of this class of tools are very optimistic as to the future. Builders of milling machines continue to operate their plants day and night to keep abreast with new orders and see nothing in the future to cause any changes in plans for expansion, as contemplated by several concerns building these tools. Castings are said to be coming forward in a satisfactory manner, and there are no delays occasioned by failure to receive them promptly.

The W. F. Potthoff Co., has reorganized, and changed its name to the Potthoff Construction Co. and has added concrete construction work to its steel construction business. Under the reorganization William F. Potthoff becomes president and Arthur Reuss vice president and general manager.

The R. K. LeBlond Machine Tool Co. is very busy on orders covering the smaller sizes of lathes and milling machines. There is some new trade developing and the outlook is said to be very satisfactory.

The Cincinnati Planer Co. is running at practically normal conditions, with a fair volume of new work being

booked. The new plant at Oakley will be ready for occupancy in a month or so which will give a large increase in floor space.

The Acme Machine Tool Co., builders of turret lathes and screw machinery, reports a very satisfactory business. This concern will occupy the present quarters of the Cincinnati Planer Co., on its removal to Oakley. Considerable new equipment will at this time be added and the output of the plant be considerably augmented.

The Cincinnati Milling Machie Co. expects very soon to occupy the new plant at Oakley. This will give them about 100,000 square feet of area which in conjunction with present plant will largely facilitate the handling of the enormous business that is theirs at the present time.

The Cincinnati Rubberless Traction Wheel Co. for the manufacture of a patent device to take the place of rubber tires on automobiles, was incorporated during the week, with a capital of $75,000. The company is expected to build a plant near Riverside O. The incorporators are Harry J. Sykes, Joseph M. Hayes, Geo. H. Wilson, Ezra G. Hayes and W. S Little.

The Cincinnati Grinder Co., which was incorporated recently at Columbus by A. C. Hoefinghoff and G. C. Kimmel, capital $35,000, will secure quarters on Spring Grove avenue, and the plant will start operations during the early spring. Mr. Kimmel was for a number of years associated with the designing department of the Norton Grinding Co. of Worcester, Mass., while for the past six years he has been chief designer for the Heald Machine Co. of the same city. Mr. Hoefinghoff was formerly connected with the Bickford Drill & Tool Co. and later with the Fairbanks company of New Orleans, and the Heald Machine Co., of Worcester. They will manufacture grinders 12 x 36 universal at the start, and later propose to develop a full line of high grade grinding machinery. The machine which they will develop at the start, will be a departure from the type of universal now in the market, in that it carries a grinding wheel of greater diameter and wider face, and is much more massive and rigid in its construction. It further offers a convenient means for obtaining the various table feed changes, and workhead speeds, through gear boxes by levers from a central position in front of the machine, thus eliminating the use of cone pulley changes in the countershaft.

MILWAUKEE.

Tool Builders Bend Every Effort to Effect Deliveries on Orders.

Milwaukee, Wis., March 7.—Milwaukee machinery and tool manufacturers are loaded up with orders and are forced to bend every effort to make deliveries as promised. The large amount of new construction work in all lines of commerce and trade has produced an unusual demand for equipment of all kinds and with the opening of the spring season and actual construction work, builders and equipment contractors are coming to the manufacturers with a rush. Many plants are increasing capacities and adding new equipment, and in many cases such improvements are decided upon now and the demand for deliveries is insistant. For three months the railroads have had trouble in moving freight in the Milwaukee yards, which are important as feeders for the great northwestern territory, especially since the Milwaukee road completed its Puget Sound extension. This week, for the first time, local officials have talked favorably to shippers and given some promise of deliveries on time.

One good feature of the situation is the lack of labor troubles. Manufacturers are congratulating themselves and at this time there is no reason to believe that the quiet will be interrupted at the annual scale period on May 1.

The Engineering Society of Wisconsin has elected the following-named officers: President, C. V. Kerch, city engineer, Janesville, Wis.; vice president, W. C. Lounsbury, chemist and superintendent of waterworks, Superior; secretary and treasurer, W. G. Kirchhoffer, city engineer, Madison, Wis. Trustees are: A. A. Babcock, Jr., Wausau; Prof. G. J. D. Mack, University of Wisconsin; E. P. Worden, Milwaukee, and B. E. Lyonds, Beloit. The society inspected the plant of the Allis-Chalmers Co. at West Allis before adjourning.

Dr. Louis E. Reber, director of the University extension division, University of Wisconsin, in an address before the City club of Chicago said that the interest in extension work shown by the Merchants & Manufacturers' Association of Milwaukee is a significant recognition among business men of the widespread need of training for efficiency. At present there are 1,367 correspondence study students in Milwaukee, of which number more than 500 are doing work in shop and power plant mathematics.

An eight-story reinforced concrete factory and office building is being erected at Michigan and Jefferson streets in Milwaukee, and the Stroh Die Molded Casting Co. will occupy the two upper floors. The concern has been located in the Johnson Service Co. building. The new building will be completed Oct. 1.

The Optenberg Iron Works of Sheboygan, Wis., has the contract for remodeling the power equipment of the Oostburg Canning Co., of Oostburg, Wis., one of the largest in the west. A new 150-horsepower Corliss engine and an additional boiler will be part of the new equipment.

TOOL TRADE ACTIVE

On the Pacific Coast—Hallidie Company Secures Order.

Seattle, March 4.

A healthy tone is manifest in the machine tool trade of the Pacific northwest. The large increase in the productive capacity of the manufacturing establishments in the Puget sound region, recently noted in these columns, is responsible for a large proportion of the recent machine tool purchases in this vicinity. Scattering orders from lumbering and other interests have also been encouraging. On account of the congested condition of the eastern factories, coupled with the delays in trans-continental freight shipments, due to severe weather, buyers who have neglected to place orders well in advance of their requirements are finding difficulty in getting deliveries early enough to suit their convenience.

Among recent heavy purchases of machine tools in this market was the sale of a complete outfit for the new Union Machinery & Supply Co.'s Seattle plant, by the Hallidie Machinery Co., Seattle. Beside smaller tools this order included five Lodge & Shipley patent head engine lathes in the following sizes: One, 16 x 10; one, 18 x 12; one, 18 x 16; one, 24 x 30, and one, 30 x 18; a 42-inch by 12-foot Harvey open-side planer; one 60-inch Niles boring mill; one 20-inch Gould & Eberhardt shaper; one No. 3 Mitts & Merrill keyseater and Cincinnati universal millers and cutter grinders.

The Carnegie Steel Co. blew out one New Castle stack, Feb. 15, one Ohio stack on Feb. 26, and one Mingo stack, Feb. 27.

OBSERVATIONS ON SEGREGATION PHENOMENA AS APPLIED TO CAST STEELS[1]

The Value of Microscopy and Synthetic Chemistry in Metallographic Investigation

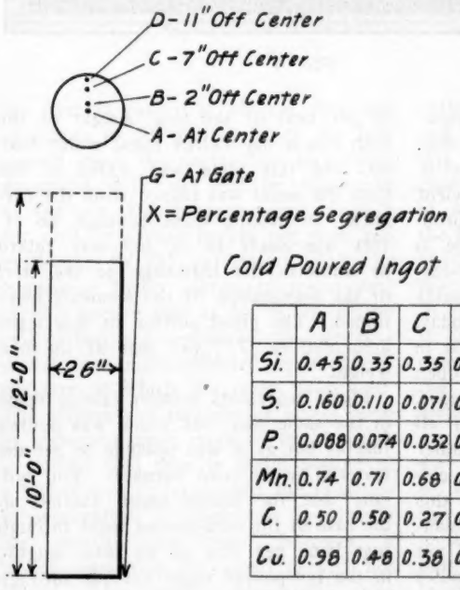
By S. S. Knight[2].

Some 14 years ago, the subject of "segregation phenomena" in cast iron was quite thoroughly investigated by the writer. The results which he published at that time were somewhat unsatisfactory, owing to the fact that in cast iron the amount of free carbon present is a factor which not only greatly hampers observation mechanically, but is of no small importance in affecting the results themselves. In steel which has undergone work, the observation of segregation phenomena could not possibly give as satisfactory results as in ingots or castings which have had no work done upon them, because the soaking, rolling or hammering all tend to more or less counteract the effect of segregation, both mechanically and chemically. Steel which is cast in sand molds has long been looked upon as more or less of an uncertainty for the purpose for which it is intended, unless very large factors of safety are allowed, on account of the almost complete impossibility of getting castings which are homogeneous. This lack of homogeneity comes about primarily from the occlusion of certain gases or foreign substances, such as dirt or slag, in the material itself while in a semi-molten or plastic condition, as well as from segregation.

The killing of steel, as it is popularly termed, is unquestionably one of the hardest things to satisfactorily accomplish in the steel casting business. If basic practice is being used, the fact that you have a slag covering the molten metal in the ladle, which is hungry for all acid-forming elements, means that it is beyond human possibility, so far as is now known, to keep your steel during pouring, of the same chemical composition. The writer has seen many basic heats running from 50 to 100 tons, poured from a single ladle, where the silicon content varied 400 to 500 per cent, from samples taken from the first and the last of the pouring, and yet the total amount of time consumed in the operation was less than half an hour. In some casting plants, the metal is tapped into a receiving ladle mounted upon trunnions, and the basic slag skimmed, and thus largely disposed of before being poured into the crane ladle, and from which it is teemed into the molds. This partially obviates the difficulties encountered from the basic slag, but tends to cool off the metal in the ladle. The Talbot process, or any of its analogues, which does all of the refining in the basic furnace, and then allows the molten steel to be transferred to the acid furnace, to be there held so that the majority of the gases may escape from the bath before having the additions made, is probably the nearest approach to perfect practice which the open-hearth industry will be able to develop, and which is applicable to large quantities of metal. Even this, while not as expensive as the after-treatment in an electric furnace, as is now being done in some four or five plants in the United States, is still too costly for the ordinary purchaser of steel castings. The reducing atmosphere of the electric furnace, as well as the tremendous agitation of the bath, caused by the passing of current through it, in all of the resistance types, necessarily tends to produce a steel of great purity, if the additions are properly made.

In acid practice, the absolute inability to lower the sulphur and phosphorus content, necessitates the use of high grade material, for which, of course, manufacturers have to pay a premium. On the other hand, acid steel, if properly made, should leave the furnace hearth almost free from absorbed gases, and before the pouring commences, should be thoroughly killed, and capable of producing castings which are free from blow holes which would arise from the composition of the steel itself. Of course the matter of blow holes arising

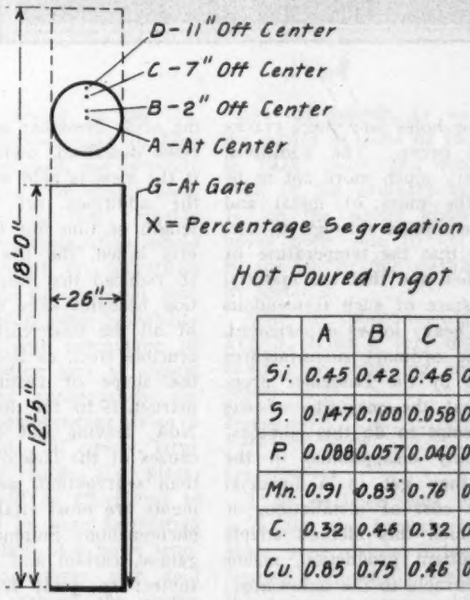
[1]Paper presented at Philadelphia Foundrymen's Association, March 2, 1910.
[2]Manager, Chester Steel Castings Co., Chester, Pa.



Cold Poured Ingot

	A	B	C	D	G	X
Si.	0.45	0.35	0.35	0.34	0.34	32.5
S.	0.160	0.110	0.071	0.051	0.052	208
P.	0.088	0.074	0.032	0.021	0.020	340
Mn.	0.74	0.71	0.68	0.68	0.61	21.5
C.	0.50	0.50	0.27	0.21	0.21	138
Cu.	0.98	0.48	0.38	0.24	0.47	108

Fig. 1.



Hot Poured Ingot

	A	B	C	D	G	X
Si.	0.45	0.42	0.46	0.38	0.34	32.5
S.	0.147	0.100	0.058	0.047	0.052	183
P.	0.088	0.057	0.040	0.032	0.030	193
Mn.	0.91	0.83	0.76	0.72	0.61	49.25
C.	0.32	0.46	0.32	0.22	0.21	148
Cu.	0.85	0.75	0.46	0.25	0.27	215

Fig. 2.

from improper sand mixtures, or dirt-holes coming from improper closing or dirty molds, are simply matters to be rectified by attention to detail in the molding shop. Probably a great deal of the trouble, which producers of steel castings, who use the acid process, have today, is due to the fact that the additions made in the furnace or ladle are not of the right composition, or are not properly made, and such expedients as aluminum shot for use in the heads and gates, are of very little value, because there should be no call for their use, as when the necessity for them arises, it simply means that the practice in some previous operation has been lamentably bad.

Now, in Bessemer practice, the steel is poured at a much higher temperature, and as a result, piping is aggravated, and shrink-holes and check-cracks more likely to occur. The additions, however, are very much more apt to be taken up by the mass of metal and thoroughly disseminated through it, owing to the fact that the temperature of the bath is higher and that the material has been in a state of such tremendous agitation. The heavy losses experienced, however, by the ordinary manufacturer making castings by the Bessemer process, is such that the majority of the people who attempt to do this commercially, are usually disappointed in the results which they get in a financial way. The low cost of installation, or facility with which this method adapts itself to intermittent production, makes it seem very desirable to the uninitiated; but as a general thing, experience seems to be showing producers of steel castings that Bessemer plants are operated to the best advantage when they are maintained as auxiliaries to large open-hearth establishments, where work of the most desirable character for this process can be furnished to them.

In the crucible steel industry, the possibility of steel being properly killed, is probably less then in any of the processes formerly described, owing to the fact that in America the production of crucible steel castings is today very largely in the hands of people who have recently gone into the business, and who know absolutely nothing of the technique of the steel industry, and who consequently cannot be expected to get the best out of the process which it is able to give. Unfortunately, its best, when graphite or black lead crucibles are used, cannot be as good as that of the acid, Bessemer or open-hearth processes described, owing to the fact that if the steel is held in the crucibles after the additions are made, a sufficient length of time for the bath to be properly killed, the life of the crucible is so reduced that this process of production becomes very expensive. Probably of all the steel cast in America today, crucible steel, as it is made and sold in the shape of castings upon the open market, is by far the least homogeneous. Now, leaving out of consideration all causes of the lack of homogeneity other than segregation, we find that five elements are most vitally concerned in this phenomenon: Sulphur, phosphorus, manganese, carbon and copper; and all are subject to great segregation in bodies of steel when cooling.

Fig. 1 shows a casting weighing approximately 22,000 pounds, and serves well to illustrate several points not heretofore very clearly explained, as far as we know. This casting was drilled at the gate *G*, where the metal practically set as soon as the pouring operation was completed, and where no chance for segregation occurred and also at the points *A*, *B*, *C* and *D*, these places being located at the center, and 2, 7 and 11 inches off center respectively. The transverse plane from which these drillings were taken, was at the extreme upper part of the solid portion of this casting, the piping taking up all of that part beyond this and the head. Other than this piping, there was no evidence of lack of mechanical homogeneity in this material. This casting was poured on end, and into the ladle was added all of the steel plate, amounting to about 12 per cent of the total weight of the bath which the molten metal would take up, and this plate was added at the time the metal was tapped from the furnace. In making these castings, no effort was made to in any way retard or diminish the shrinkage of the steel or the segregation of the elements mentioned. The piped portion of this ingot amounted to 17.75 per cent of its total weight.

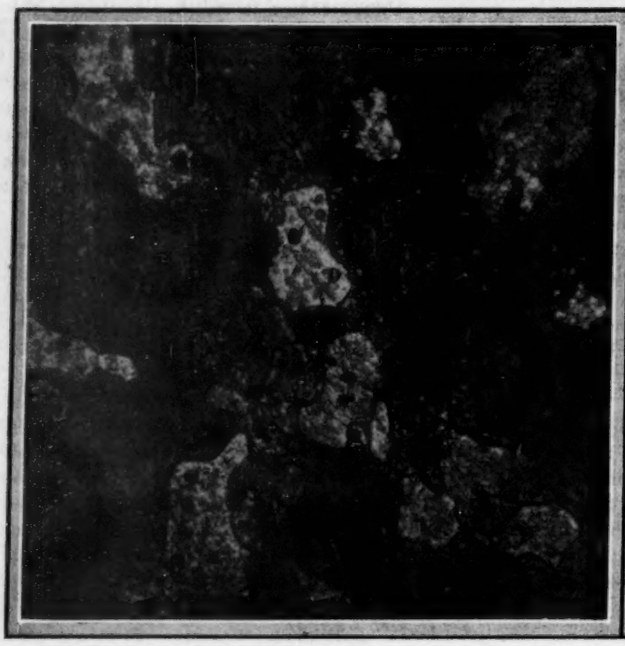


FIG. 3.

FIG. 4.

Fig. 2 represents another casting made in the same way, but which was poured just as hot as it was possible to get the material in an acid furnace. You will note that the piping which extends in the case of the cold-poured ingot through just 16.66 per cent of its total length; in the hot-poured ingot extends through 30.5 per cent of its total length. The piped portion of the ingot was 27.5 per

cent of its total weight. Inasmuch as both of these were cast in absolutely dry molds, this seems to show conclusively that the colder the metal can be poured into any casting, the less piping and shrinkage there will be when the metal sets. Now, by looking at the analyses of the drillings which came from this hot-poured ingot, the location of each sample being analogous, as we described for the cold-poured ingot, you will notice at once that the hotter the material is at the time the casting is poured, the less the tendency to segregation. For instance, in these two ingots, the tendency to segregate was identical as far as the silicon was concerned, or 32.5 per cent. In the cold-poured ingot, the segregation in sulphur amounted to over 208 per cent, in phosphorus to 340 per cent, in manganese to 21.5 per cent, in carbon to 138 per cent, and in copper to 108 per cent. In the hot-poured ingot, the segregation in sulphur amounted to 183 per cent, in phosphorus to 193 per cent, in manganese to 49.25 per cent, in carbon to 148 per cent, and in copper to 215 per cent. Now, by comparing these figures, it seems reasonably certain that as far as the silicon and carbon are concerned, the segregation is not much affected by the temperature at which the metal is poured. The sulphur and phosphorus would seem to segregate much more in metal which is poured cold than in metal poured at a higher temperature, while the tendency to segregation in manganese is directly the opposite. In copper, however, it would seem that the metal poured hot shows a far greater segregation than the metal poured cold.

These figures, in the light of what has been published within the last few years upon the phenomena of segregation, would seem to show that many of our popular theories are decidedly at variance with the facts. In the first place, the slow and gradual cooling which is supposed to prevent segregation, does so with only certain elements; or, at least, this is the deduction which would necessarily follow from the figures given above. In the next place, the keeping of a perfect heat condition in the fluid or semi-fluid metal, would probably tend to eliminate a large proportion of the segregated impurities, provided the temperature of the upper part could be so regulated that the extreme upper surface was the last to cool or set; in other words, that the cooling would take place, starting at the bottom and slowly rising to the top, and in a regular manner. As to how this is to be accomplished, we certainly cannot form any idea. It would seem in any ordinary casting that probably the greatest cause for segregation would be the throwing out of the impurities toward the center as the material sets. In the ordinary casting, the probability is that in a very large percentage of cases, the whole casting sets at almost the same time, and consequently the material is fairly homogeneous from a mechanical standpoint. Of course, large die blocks, forging ingots and pieces of such nature, would be exceptions to this rule. It would be very interesting to study the segregation of a large sand-cast ingot, providing same was split longitudinally right through the center, a series of drillings being carefully made, and analyses accurately determined.

Now, by looking at the analyses of the drillings taken from the several points, it will be noticed that of all the elements, sulphur, phosphorus and copper, show the greatest tendency towards segregation. In the case of sulphur, the writer is almost positive that all of this element which occurs in steel is in the form of iron sulphide of the chemical composition FeS. In cast iron, he believes that a portion of the sulphur is in the form of FeS_2, and this is true with all forms of iron in which the amount of graphite or free carbon exists to any appreciable extent. This assumption is based upon the fact that in order to get the maximum amount of sulphur by the evolution method, out of pig iron or cast iron, it is necessary to roast the sample, as was described by the writer in some of the trade journals in 1903. Now, this roasting is of no avail in the ordinary carbon steels, so far as the writer knows, and he has never been able to get higher results by the use of this method on that class of material.

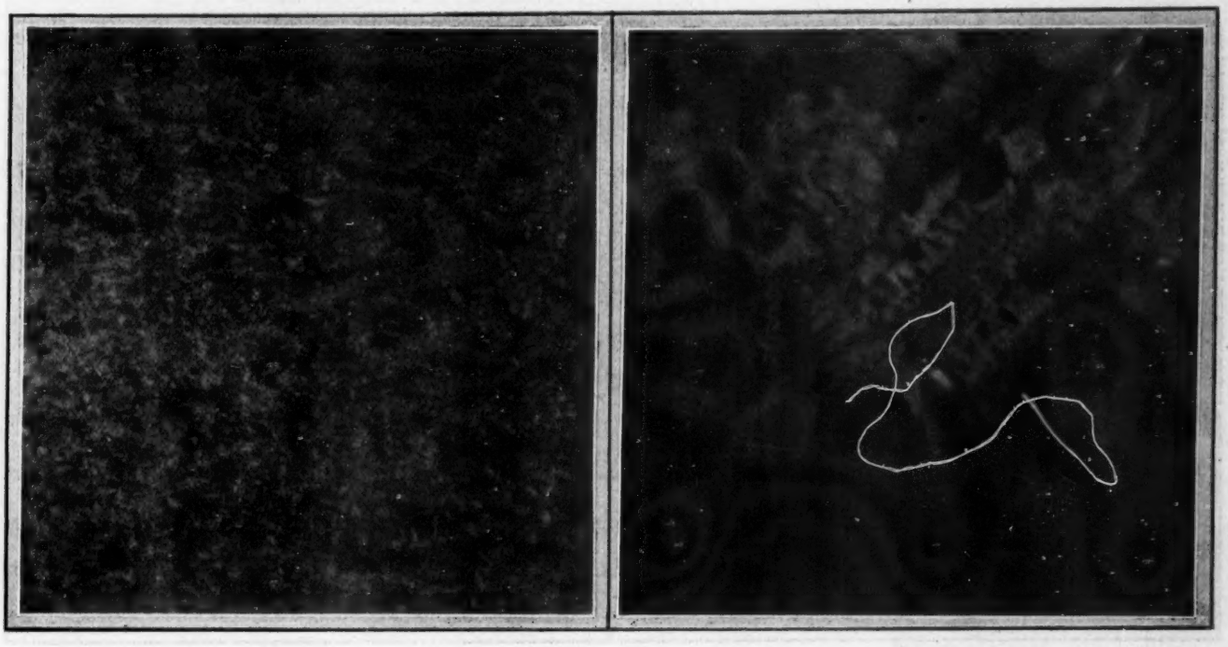


FIG. 5.

FIG. 6.

Now, the photo-micrograph shown in Fig. 3, shows a very mild refined iron, having the following composition:

Silicon	0.188 per cent
Sulphur	0.203 per cent
Phosphorus	0.020 per cent
Manganese—None	
Carbon	0.02 per cent
Copper—None	

This specimen was etched in nitric acid, and the crystals of iron sulphide show very plainly, although the magnification is only 86 diameters. In cast iron, the writer was never able to isolate the sulphides metallographically. It is further

his belief that in all steel, the sulphur tends to segregate, and these segregations are one of the most fruitful causes of failure known to the steel industry. It would consequently seem a very wise provision on the part of the American Society for Testing Materials in limiting the sulphur content to a maximum of 0.050 per cent.

In regard to the segregation of phosphorus in iron, the writer is of the opinion that there exists in all carbon steels, the possibility of the occurrence of three distinct and separate phosphorus compounds. The first of these is shown in Fig. 4, which is a photo-micrograph of a very high phosphorus steel, the analysis being as follows:

Sulphur	0.170 per cent
Phosphorus	11.08 per cent

This material had no carbon, manganese, silicon or copper in it. These peculiar crystals seem to be momoclinic, and their arrangement is characteristic of this compound of phosphorus and iron. From experiments which the writer has conducted, he believes that the formula for this phosphide is represented by the symbol Fe_2P_3. The magnification shown in the photo-micrograph is only 86 diameters. These crystals are very soft, and they crumble readily and break almost in any direction. Practically all of them show signs of cleavage transversely, such cleaving planes usually being separated four or five times the diameter of the crystals.

You will readily see from the photo-micrograph that this peculiar style of arrangement tends more to structural weakness than probably any other which could be shown.

The next photo-micrograph—Fig. 5—shows another phosphide of iron taken from a lower phosphorus steel, where there was no carbon, silicon or manganese present. The sulphur was 0.128 per cent, and the phosphorus was 9.600 per cent. The magnification shown is 86 diameters, and these crystals are fairly hard and do not easily crush. The writer believes this material to have formula FeP, although some of his experiments led him to believe that the prosphorus content would be sometimes much less than that shown by the above formula.

The next photo-micrograph—Fig. 6—illustrates another phosphide of iron, a single crystal being shown. This particular phosphide was first shown to the writer by Wirt Tassen, as isolated from a meteorite, but the magnification which he used was very much higher than that shown in this photo-micrograph, and it leads me to believe that there is a possibility that there is still another phosphide of iron which is sometimes present in which the phosphorus content is as low as the formula shows. The analysis of the specimen shown is—

Sulphur	0.085 per cent
Phosphorus	3.88 per cent

silicon, manganese, carbon and copper being absent. The magnification shown is 340 diameters, and Mr. Tassen states that the formula for this phosphide is Fe_3P.

The segregation of manganese in cast steel has been for many years one of the most elusive phenomena of which the observation was ever undertaken by the writer. This element seems to possess the power to combine with sulphur at the high temperature of molten steel, or anything above 1,200 degrees Cent., and to form a very light slag, which is immediately thrown to the surface. Instances are on record of where material containing as high as 0.400 per cent sulphur, loses 75 per cent of its sulphur content at once upon the addition of 2 per cent of high grade ferro-manganese, the same being stirred into the mixture in the form of a powder. The crystal shown is one of a number which the writer has found in cemented steel only under high magnification, which he believes to be a crystal of manganese sulphide having the formula MnS. These crystals are harder than soft cemented steel, and in polishing, stand above the rest of the surface, and so take a light, iridescent sheen just before the main surface of the section comes into focus under the microscope.

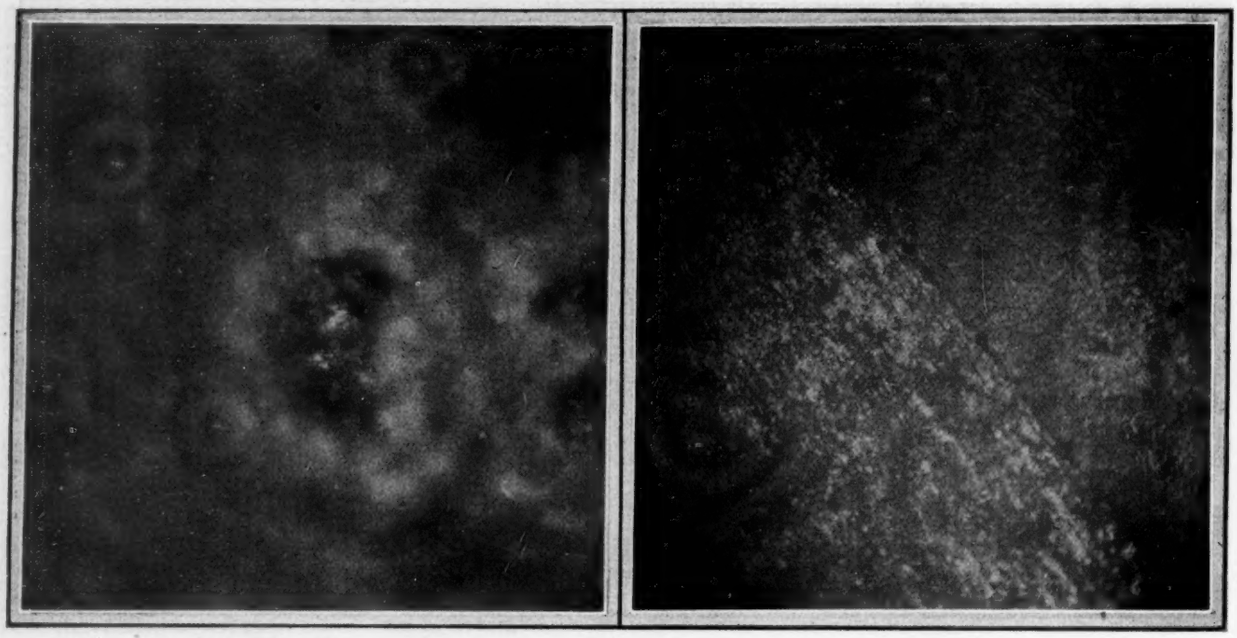


FIG. 7. FIG. 8.

The next photo-micrograph shown in Fig. 7 is from a sample running as follows, the crystal seen being characteristic of this form of manganese compound:

Silicon	0.600 per cent
Sulphur	0.175 per cent
Phosphorus	0.045 per cent
Manganese	0.080 per cent
Combined carbon	0.82 per cent
Temper carbon	1.82 per cent
Copper	0.080 per cent

This specimen is etched with nitric acid.

In regard to the silicon content in iron and steel, so far the writer has been unable to isolate, either metallographically or chemically, any silicon iron compound. Since its percentage of

segregation is so small, it naturally leads us to believe that if the solid solution theory could be applied anywhere, it would be more applicable to silicon than to any of the other elements.

In regard to the copper existing in steel, Fig. 8 shows the so-called alloy film in a sample of copper-clad steel rod. The copper sheathing of this rod was as nearly pure as it would be possible to get copper, running 99.37 per cent. The steel itself analyzed as follows:

Silicon	0.100 per cent
Sulphur	0.018 per cent
Phosphorus	0.020 per cent
Manganese	0.55 per cent
Carbon	0.170 per cent
Copper	0.06 per cent

The alloy film itself is shown in detail in Fig. 9, which is simply a higher magnification of the sample shown in Fig. 8, the latter being 430 diameters, while the former is 86 diameters.

Fig. 10 shows a sample of copper steel containing 0.013 per cent silicon, with 15.96 per cent copper, and practically no sulphur, phosphorus or carbon. The crystals shown, the writer believes to be iron cupride, having the formula Fe_2Cu_3. The specimen is etched with picric acid. The magnification shown is 48 diameters.

In the investigation of the segregation of the metalloids in carbon steels, there is certainly one of the most faithful fields of research open today in the metallurgical world. As far as the writer knows, the photographs here shown are the first ever published of the sulphur, phosphorus, manganese and copper compounds of iron as found in manufactured material. The investigation of such phenomena as fatigue will also bring forth results of the most practical nature. From what work the writer has done individually he is led to believe, on account of the inability of anyone to isolate the compounds of phosphorus, sulphur, silicon and copper, when these elements exist in percentages of less than those specified by the American Society for Testing Materials, that it seems only probable that perhaps something similar to what is known as solid solution may occur under these circumstances. However, this would be very hard to prove, inasmuch as it would be almost impossible to find these compounds, even if they did exist in steels which contained them in small quantities.

The carbon iron compounds are already thoroughly isolated metallographically, and a good deal is known about them chemically, and this is so much a matter of common knowledge that it is not worth while to take up time with it now, as all of the standard works (particularly that of Floris Osmond) are very comprehensive upon this point.

In conclusion, too much stress cannot be laid upon the importance of a thorough investigation of this field by a number of independent workers, so that the results obtained may be properly tabulated and inferences drawn, which will be much more comprehensive and correct than are now possible, owing to the small amount of information available at the present time. It seems that in this particular field, the most is to be expected out of the investigations which will be made in the future, since the use of iron and steel is becoming more common every day, and will become more so, as lumber of all kinds each year is harder to get and the supply more limited. The tremendous reduction in price which has been made within the last three or four years in microscopic apparatus, and the ease with which it can be obtained, all point toward a very much greater number of investigators in this field in the near future. To the investigator, a knowledge of analytic and synthetic chemistry is absolutely essential, if he is to accomplish anything in the field of metallographical investigation. However, this knowledge is so easily obtained, not only in our schools, but also in the laboratories of our large industrial plants, that there is reason to believe that investigations along these lines will be more active and that the results achieved will fully repay anyone for the labor and sacrifice made.

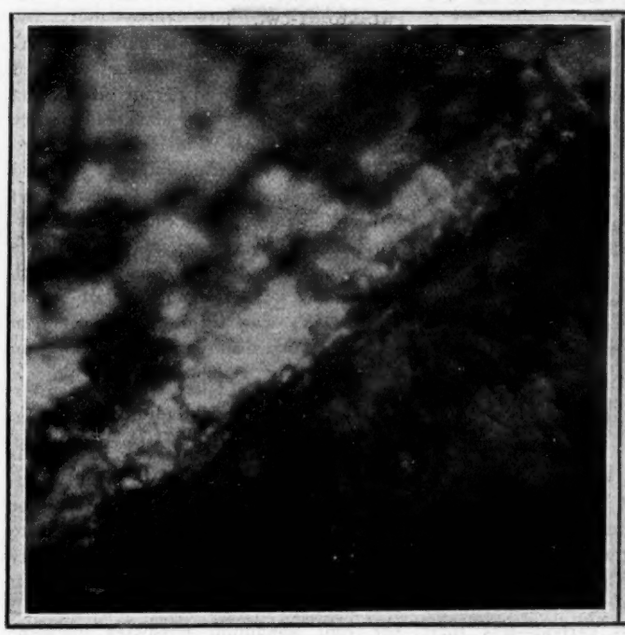


FIG. 9.

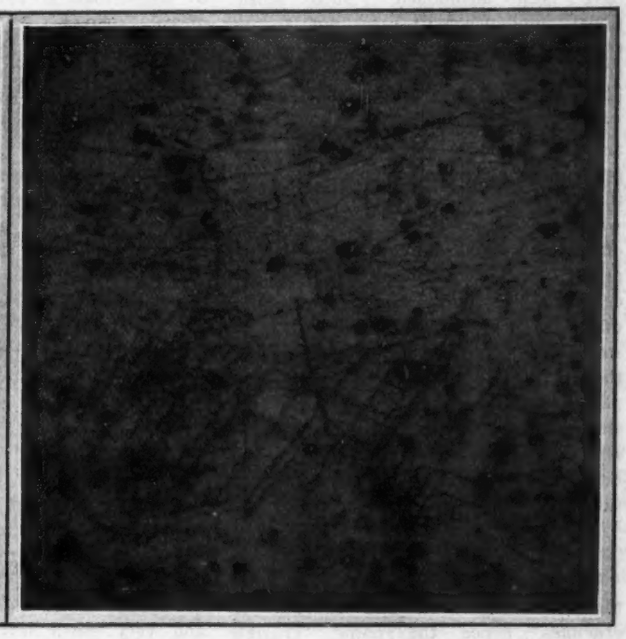


FIG. 10.

The American Brass Co., Waterbury, Conn., chose these directors at the annual meeting: C. F. Brooker, A. A. Cowles, J. S. Elton, Arthur C. James, John E. Wayland, C. H. Dodge, James A. Doughty, J. P. Elton, A. P. Hine, E. L. Frisbie, G. W. Burnham, T. B. Burnham, T. B. Kent, Edward Holbrook, John J. Sinclair. The directors elected the following officers: President, Charles F. Brooker; first vice president, Edward L. Frisbie; second vice president, Alfred A. Cowles; third vice president, James S. Elton; treasurer, John P. Elton; secretary, Gordon W. Burnham; assistant secretary, James A. Doughty.

DEVELOPMENT AND USE OF THE NEW HIGH-SPEED STEELS*

The Latest Information on the Subject of High Duty Tools in English Practice.

By Walter Carter.

When almost one year ago, statements were made by a well-known professor respecting the powers of a certain high-speed steel, the metallurgical and engineering world received a greater shock than had probably ever previously been experienced, but it is now very generally admitted that claims were then made which have since been found to be inaccurate and consequently have been abandoned. Such sensational announcements are not to be commended, for it is common knowledge that the results of many of the trials made with the earlier "New High-Speed Steels" were not of such a character as to induce a belief that any improvements had been effected, but rather the reverse. Consequently prejudices were engendered which have had the effect of delaying the use of really improved "New High-Speed Steels" to the detriment of perhaps the successful steel maker, but certainly to the advantage of steel users. The object of this paper then is to give particulars of some applications and uses of new high-speed steels and to show that in some instances at least very considerable economies may be effected by the use of the same.

Tool Steel Manufacture.

Tool or "crucible" steel is made by the fusion of iron and charcoal in crucibles, hence the name "crucible steel." All steel which is made in crucibles is not necessarily tool steel, steel so manufactured being used for some other and specific purposes, So far, however, as the subject of this paper is concerned, tool steel means steel made in crucibles. In the manufacture of "ordinary" or "carbon" tool steels, bar iron, after conversion into blister steel by cementation with charcoal, is broken up into suitable sizes, melted in a pot or crucible, poured into a cast iron mold, and allowed to cool. The resulting ingot is afterwards reheated and either hammered or rolled to the form and size required. This is not the only method, but it may be taken as a general method, and will serve to show how other steels have been developed. There are two well-known, and a third less known, methods of melting crucible steel, *i. e.*, in coke-fired, gas-fired, and electrically-heated furnaces. While each of these methods possess advantages peculiar to themselves, the gas and electrical methods have usually the stronger advocates and the stronger merits proclaimed for them, but whatever advantages there may be from the use of them, they are most certainly not in the direction of producing higher qualities of steels than are produced by the aid of coke firing.

The addition of small quantities of tungsten, chromium, silicon, etc., produce what may be referred to as "carbon-alloy" steels, though not usually referred to as such. Carbon-alloy steels have advantages over "straight-carbon" steels for certain purposes, in that tools made of such steel have greater cutting powers, while they also possess a distinct advantage of being forged and hardened with less risk of failure. Self-hardened steels are made in the same way, but contain greater percentages of tungsten, carbon and manganese and silicon. These steels are very hard when cold and were the forerunners of the quick-cutting steels.

High-speed steels (which are also self-hardening), although usually assisted to cool by either cold air blast or quenching in oil, follow the lines of the old self-hardening steel, but contain greater quantities of tungsten and chromium, and very much less carbon—less than one-fourth the quantity. The difference of carbon contents is the real and greatest difference between the old self-hardening steel and high-speed steels, and so far as the present knowledge of heat treatments extend, an insurmountable barrier to the old self-hardening steels ever working successfully as high-speed steels.

Introduction of New Element.

The new high-speed steels do not differ very greatly from what must now be termed ordinary high-speed steels, except principally in one particular; that being the use of one element not hitherto used commercially in high-speed steels, *i. e.*, vanadium. Some makers are, it is true, using molybdenum to a greater extent than formerly, whilst titanium and other elements have been experimented with, but it cannot yet be said that such steels have proved entirely satisfactory.

Vanadium is an element found in different parts of the world—Mexico, Sweden, Spain, etc.—but the quantities were not such as to make the mining of it commercial. Recently, however, considerable quantities of the ore have been found in South America. Pure vanadium is silvery white in appearance and only melts at a very high temperature. The ore is calcined in special furnaces and made into units of ½-cwt. to 1-cwt. lots, these units being termed "buttons," which are afterwards broken up into the sizes required by the steel maker, different sizes being used, according to the class of furnace in which the steel is melted. The manufacture of this vanadium is effected by secret methods, the largest plant hitherto having been located near Pittsburg. Recently, however, a plant has been started at Garston, near Liverpool, under the superintendence of Kent Smith, who was formerly connected in an important capacity with the American Vanadium Co., Pittsburg.

Use of Vanadium.

The use of vanadium in tool steels may almost be referred to as Homeopathic Metallurgy, for it appears to be almost a question of not how much to use, but rather how small a quantity which may be instanced from the fact that high-speed steel containing only 0.25 per cent vanadium possesses in some cases twice the cutting capacity of similar steel which does not contain vanadium. The very powerful nature of it naturally makes it very difficult to use, for in addition to a capacity for imparting increased cutting powers to the steel, it also exerts a very pronounced scavenging or cleansing action, owing to the affinity of vanadium for oxygen and nitrogen, with which it combines and passes off, or is removed in the slag. Should this scavenging action be too severe, the resulting steel will not possess that "body" without which tool steel can never be satisfactory. It is also evident that if a portion representing 1-400 part of the whole exerts such enormous influence over the result, the personal element is correspondingly an important one; for the more powerful the instrument employed the greater is this personal element intensified. The manufacture and use of such steels then will more and more tend to differentiate

*Abstract of paper read Feb. 5 before the Birmingham Association of Mechanical Engineers.

and classify steel manufacturers according to their ability to use well the materials nature has provided, as distinct from merely using so much of this and that.

It is interesting to refer here to a statement found in a paper read before the Iron and Steel Institute, in October, 1904, by J. M. Gedhill, proving very conclusively two things: (1) That the use of vanadium in high-speed steels is not entirely new or novel; (2) that the phrase "Homeopathic Metallurgy" expresses the use of vanadium, and confirms a previous remark that it is not nearly so important a question of what is contained in the steel as the manner in which such materials are used. The statement is as follows: "Mention may here be made of an interesting experiment to ascertain what effect would be produced in a rapid cutting steel by substituting vanadium for chromium. The amount of vanadium was 2 per cent. The steel readily forged, worked very tough, and was hardened by heating to a white heat and cooling in an air blast. This tool, when tried on medium steel, stood well, *but not better than* the steel with the much cheaper element, chromium, in it."

Use of Molybdenum and Tungsten.

This statement proves that the composition of steels is not more important as the art of using the materials of which they are made. Amongst the tools in the possession of the writer is one very rich in vanadium, molybdenum and tungsten, and costing something like 4s 6d per pound. Comparative trials between it and other steels proved very conclusively that such a steel was greatly inferior to several less costly steels, the "Triumph Superb" steel costing very considerably less than the much richer steel, being more than three times better. Clearly then the cutting powers of steel are not merely a question of what they are composed of. Owing to the very high price of vanadium—something over 20s per pound—some makers are endeavoring to restrict its use by using increased quantities of molybdenum to obtain equally good results. The latter, whilst being less powerful than vanadium, is also much cheaper. Steels containing it, however, are considered somewhat unreliable owing to the variation of the results. They appear to be too responsive to treatments and consequently very difficult to harden uniformly. A peculiarity of molybdenum steels is that they do not require such a high heat as the tungsten steels in order to obtain the greatest efficiency from them, and if higher temperatures are used the tools are inferior. Molybdenum, it may be mentioned, is weight for weight about twice as powerful as tungsten. Steels containing molybdenum are, however, not considered as good as the tungsten steels, owing to the variable results obtained from them. As far as the other elements are concerned there is no necessity to speak at length. The use of tungsten in high-speed steel we are all more or less familiar with. In the new high-speed steels some makers are maintaining the tungsten content and adding small quantities of vanadium, while others are reducing the tungsten content and using larger quantities of vanadium. It is important that the elements of the composition be balanced, otherwise failure will result, just in the same manner as a piece of mechanism must be well proportioned and balanced if the best results are to be obtained.

Development of Alloy Steels.

Each class of steel has virtues and defects inherent to the analysis and process of manufacture, and nothing but time and experience will decide which is best adapted and most suitable for engineering requirements. While it is not proposed to refer in detail to analysis, this being almost entirely, as has been shown, a matter for the steel maker, it will be interesting to refer to the work accomplished by various brands of high-speed steel representing different makers, giving briefly the analysis and the work done. As in the case of so many other improvements, the use of vanadium in steels is not absolutely new, as it has been used for a greater or less extent for several years, previous to what may be termed the regular use of it. The almost prohibitive cost of it, however, together with the difficulty of using it, retarded its development, while there was not the same incentive to continue the necessary and costly experimenting because of the fact of tungsten-chromium high-speed steels not at that period having attained such a full development as now When the latter steels had reached practically their full development it was found that a tungsten content of 18 per cent was about the maximum quantity which could be advantageously used; so that if progress had to be continued, it was evident it must be sought along other paths. That progress has been made is testified by the fact that high-speed steels containing as low as 12 per cent tungsten and a small quantity of vanadium are in many instances displacing the 18 per cent tungsten steel.

The presence of vanadium in tool steel raises what is known as the "critical" point, and so gives to tools made of such steel greater heat-resisting properties, and renders possible higher cutting speeds. The tools are also harder, maintain a sharper cutting edge, and consequently cut cleaner and require less power per unit of work done. They also cut very hard materials, such as chilled rolls, brake-hardened railway and car tires, manganese-steel castings, etc., more satisfactorily than do the former ordinary high-speed steels.

Referring now to the treatment of these new steels (which do not differ greatly from the method of treating ordinary high-speed steels), it is advisable to heat the steel very gradually, starting without blast, and to insure the bar being heated through the center. When quite heated through the steel should be raised to a full yellow heat, when it can be forged easily and rapidly. The steel should not be forged too cold, otherwise cracks may result.

It is not too much to say that the claims made respecting the hardening of the new steels in water created quite as much interest as the claims of the greater cutting capacity. While the latter has, without doubt, been quite substantiated, the former has practically been abandoned, and until the art of steel manufacture and hardening is further advanced, it is to be hoped that this will not be revived. There is certainly nothing novel in hardening high-speed steel in water, and there does not yet appear to be any advantage in doing so. It is more productive of cracked tools than air hardening, but this is scarcely an advantage.

Treatment of High Speed Steel.

Since the object of tool steel is primarily to cut metal, the treatment of hardening should be arranged to suit the steel and not to suit the steel to the treatment, for the latter is not the end, but only the means to the end. This is a point that cannot be too strongly insisted upon, for there appears at times to be a tendency not to regard a cutter or tool as merely a means of obtaining a result, but the result itself. While such a theory may be acceptable to the steel or tool maker it does not fulfill the requirements of the tool user, to whom it matters not whether the tool be hard or soft, provided that with it the desired results can be satisfactorily obtained. It is conceded that for certain tools, such as "formed" cutters, worm and spur hobs, taps, screwing dies, etc., and where a smooth surface is required, many persons prefer and use oil cooling because, by so doing, it is easier to obtain smoother surfaces than by air cooling, but even this is more a question of correct heating than the manner of cooling, for if an efficient furnace be used, in which there is no free oxygen, the cutters will be quite smooth even when cooled in air. It cannot be too strongly noted that the correct heating of high-speed steel is of much greater

consequence than the particular method of cooling adopted.

The methods advised for hardening the new steels are as follows: Slowly pre-heat the cutter or tool to a medium red heat, say about 1,500 degrees Fahr., then raise to temperature of: White heat about 2,200 degrees for air hardening; yellow or lemon heat about 2,000 degrees for oil hardening.

Interesting as the foregoing may be, the most important question has yet to be answered, and until the pass word of economy can be given, these new steels cannot be admitted through the gates of discriminating doubt into the regions of unequivocal acceptance. I propose therefore to relate some instances of the successful use of the steel and the economies resulting.

A cast iron face-plate 42 inches in diameter, having slots and holes in the face, was machined all over in 14 minutes, the cutting speed being 100 feet per minute, the depth of cut 5-16 inch, and the feed 1-9 inch per revolution, the tool 1½ inches square of "Triumph-Superb" high-speed steel being quite uninjured at the conclusion. This work was accomplished in a lathe with variable speed drive. If we assume that the time be increased to 20 minutes for regular work, against 25 minutes when using ordinary high-speed steel, it represents a saving of two hours per week. A lathe of capacity large enough to swing a 42-inch face-plate would probably cost a matter of £360, and be rated at say 2s per hour with overhead charge. At a saving of only 4s per week, then the tool, 1½ inches square x 18 inches would be absolutely paid for in 7½ weeks, without noting the value of the increased output per unit of floor space.

Instances of Successful Use.

Taking another instance, a gas engine crank shaft, 16¼ inches diameter, was turned at 70 feet per minute, ¼ inch depth of cut and ⅛ inch feed. The tool 1¼ inches square of "Triumph-Superb" steel finished the shaft without grinding, and removed 580 pounds of material and was still in excellent condition. Formerly, using ordinary high-speed steel, it was not found possible to cut at a speed of more than 60 feet per minute, the tools usually requiring grinding after cutting away about 390 pounds only. The saving then is one-sixth of the cutting time and the cost of certainly two grindings. The 580 pounds removed represents 1 hour 24 minutes cutting compared with 1 hour 38 minutes cutting time and say 15 minutes for changing and grinding tools when using ordinary high-speed steel. Assuming the value of the lathe and workman to be 2s 6d per hour, the saving on one shaft in cutting and grinding would be 1s 3d. The tool 1¼ inches square by 15 inches long being worth 16s 6d, the entire cost of it is saved in 13½ hours' work. This does not take into account the saving of the cost of forging, etc.

Another example was turning bars in a hexagon turret lathe. The bars were 2 inches diameter and reduced to 1 inch diameter, 5 inches long at one end. This reduction was taken at one cut. Using ordinary high-speed steel, 30 ends turned was the greatest number done by one tool per grinding, whereas with the new high-speed steel an average of 65 ends per grinding is easily maintained. The time required to take out the tools, grind and set up again, is about 12 minutes, so that to produce 400 (one week's work) with ordinary high-speed steel means a loss of 156 minutes for grinding, etc., whereas with the new high-speed steel 400 ends can be reduced with a loss of 72 minutes only for grinding, etc., giving 84 minutes extra for cutting time. The steel in this case was ¾ x 1 x 10 inches—3s 3d—about two hours' value of the lathe and operator.

A Remarkable Performance.

Perhaps the most convincing and complete test of all was made by a celebrated firm of motor engineers. It was started with two tools, each ⅝ x 1 inch, 12 inches long, one being made of best quality ordinary high-speed steel and the other of the new high-speed steels. They were used under precisely the same conditions, the articles machined being normalized nickel steel and turned to limit gages, the tools being reground as soon as the work exceeded the limits allowed. It was arranged that each tool should be ground 40 times between forgings, and forged six times before being discarded. The labor cost of 40 grindings and one forging and hardening was ascertained to be 18s 4d. The average number machined by the new high-speed steel was 18 per grinding = 720 per forging and 4,320 per tool. The average number machined by the ordinary high-speed steel was eight per grinding = 320 per forging and 1,920 per tool.

At the rate of 18s 4d the labor cost for grinding 240 times and forging six times was 9s 2½d, and for this expenditure 4,320 articles were produced. In order to produce the same quantity the ordinary high-speed steel required grinding 540 times and forging 13½ times, requiring an expenditure for labor of £1 4s 0½d. The new high-speed steel consumed was ⅝ x 1 x 12 inches long, at a price of 2s 6d per pound = a value of 3s 3d; of the ordinary high-speed steel 27 inches was consumed, at a price of 1s 6d per pound = a value of 4s 9d, so that in addition to the extra expense of 14s 10d for grinding and forging, 1s 3d must be added for the additional cost of the greater amount of ordinary high-speed steel used, making a total saving, by using the new high-speed steel, of 16s 1d. As a matter of fact, the gross saving would be much greater, for no account has been taken of establishment charges and extra wear on grindstones, consumption of power, etc., etc., which, of course, are much greater than the net labor costs.

How New Steels Avoid Waste.

Referring now to the cutting of specially hard materials, some months ago some steel was required for the purpose of machining some rather hard malleable castings. The ordinary high-speed steels failed entirely to cut the castings with any degree of satisfaction even at speeds of 20 feet per minute, so much so that a consignment of upwards of £50 value was about to be rejected. A tool of "Triumph Superb" high-speed steel machined these same castings at speeds ranging from 45 to 70 feet per minute, so that all the castings were finished and accepted. The value of the tool in this case must be very high. In another instance an old brake-hardened high-tensile railway carriage tire, pronounced absolutely unturnable by ordinary high-speed steels, was turned with a "Triumph-Superb" tool in about 60 minutes, with only one grinding of the tool. Some of the chips from this tire were so hard that it was not possible to file them even with a smooth file. The value of the tool in this case must also be very high. More recently a steel casting, comprising the half of a large spur wheel, was so hard in places that ordinary high-speed steels failed to cut it and the matter assumed serious proportions in consequence, as a reannealing would have been a costly matter, necessitating expenditure for freight, time, etc. A tool of the new steel finished the entire casting in something under four hours. What was the value of the steel in this instance?

Using a Tool Three Months Without Grinding.

A foreign firm of engineers, who were asked if they could supply any interesting information, replied that they had been planing steel rails for points and crossings for a period of 3½ months without finding it necessary to grind the tool, and this was still sharp enough for further use. No particulars of the speed, feed, etc., were given, but presumably they were not very high.

The economical use of these new high-speed steels is by no means confined to the use of turning and similar tools, as

the few results to be submitted very clearly show. A hob of 1½ inches circular pitch, and made of "Triumph-Superb" high-speed steel cut two wheels of 54 teeth by 5 inches face, and one wheel of 62 teeth by 5 inches face at a cutting speed of 69 feet per minute, making a total depth cut of 850 inches, and the hob being in good condition at the finish. A similar hob but made of ordinary high-speed steel was previously used for such work, but at a cutting speed of 48 feet per minute only. When tried at 69 feet per minute, it required grinding after cutting 2 inches only of a 54-tooth wheel, so that the difference in this case was eight to one in favor of the hob made of the new steel. All the wheels, it may be stated, were made of close-grained cast iron.

In another case of milling some hard-steel forgings, whereas a cutter made of ordinary high-speed steel required grinding after machining 12 only; a cutter made of the new high-speed steel finished 40 such forgings before requiring grinding.

The new steels do not yet appear to have been largely used for twist drills owing partly perhaps to discounts receiving so much consideration, but judging from results of trials that have been made there would seem to be a large field for the profitable use of them—not perhaps generally, but in judiciously selected cases. In one test, drilling hard cast iron of 3 inches thickness, drills 15-16 inches diameter and making 333 revolutions per minute with a feed of 0.015 inches per revolution = 5 inches per minute, an ordinary high-speed twist drill failed after drilling five holes only, whereas a similar drill, but made of the new high-speed steel, drilled 28 holes before failing.

Use for Files.

Before concluding, it may be interesting to refer to economies that may be effected by the judicious selection and use of a class of tool not yet referred to, viz.: An engineer's file. Of all tools used by engineers which should receive consideration, but which in many instances do not, files must surely be the most neglected. The question of first cost or discount from the Sheffield list is in many cases only considered, and yet what a short-sighted policy this is. Files should be considered and bought per unit of work done. A well-made file is something more than a piece of steel nicked indiscriminately and hardened without thought and care. It is a cutting tool capable of doing good or bad work, accordingly as it is designed and made, the teeth of which may either cut freely with a minimum of power and give a maximum of output, or when badly made become a pushing-off tool consuming a maximum amount of power, and giving in return a minimum of output. E. G. Herbert, of Manchester, has shown that to do the same amount of work may cost either 36s or 5s 3d only, depending entirely on the class of file used. These higher qualities of files are not unduly expensive in first cost, and considerably cheaper and more economical in actual use. A few days ago particulars of a test were received which showed that one high-speed file finished 58 pairs of cast iron pulleys 28 inches diameter by 6 inches face against a lower-priced file's doing 18 pairs only, showing a difference of more than three to one in favor of the higher-quality file. The difference of cost of the two files would not be nearly so much, and very clearly shows the wisdom and economy of using the higher quality of file compared with using the high-discount file. There is reason to believe that this result is quite representative of the comparative quality of the files indicated, and can readily be supported by many machine tool builders and motor engineers, who have used the high-speed files.

Results have been submitted in this paper intended to show that steels now exist that are as much in advance of ordinary high-speed steels as the ordinary high-speed steel indicated was in advance of the steel it displaced. The question suggested therefore is, are we showing an equal promptness to avail ourselves of these new steels, and to obtain the advantages and economies resulting from the use of them?

HARMONIOUS POLICIES.

Promoted by the Annual Institute of Pacific Hardware & Steel Co.

"A country of magnificent distances," is one of the characterizations applied to the Pacific coast. These magnificent distances engender peculiar problems in the conduct of any business enterprise which attempts to operate over the whole length and breadth of the western seaboard. Among these problems is one which has been keenly felt by the iron and steel jobbers of the west—the problem of keeping their widely scattered sales forces working together harmoniously and consistently, in order that the general policy of the firm itself in all its departments might be single minded and consistent.

To assist the harmonious development of its business, which covers a wide range of territory, the Pacific Hardware & Steel Co., with headquarters at San Francisco, has adopted a policy of holding meetings of its sales force during the month of December in each year.

The company operates warehouses in the following cities: Los Angeles, Cal., San Francisco, Cal., Portland, Ore., and Seattle, Wash. The distance between Seatle and Los Angeles is 1,441 miles; the climate and general surroundings of the two localities are very different. The advantage of bringing together the sales forces of these two extremes, and of the intermediate localities lying between, for mutual discussion and study, is readily seen.

The plan of work followed by the Pacific Hardware & Steel Co., at its annual institute is as follows: The men from the branch warehouses and rolling mills congregate in San Francisco in December for a period usually of ten days, during which time each department manager discusses with them fully the items carried in his department. This is taken up with the men as a body, the manager going over each page of the catalog and addressing the salesmen on each item that he believes requires explanation and at the expiration of his discourse the men are allowed, in turn, to ask for information regarding prices, manufacture or other data that may be required in their respective territories. In this way the salesmen as a whole are given the benefit of any question and reply, as very often similar conditions have arisen in other territories at a later date, which makes it possible to take care of the situation promptly and intelligently.

The meetings are found to be a great source of education to the department managers as well, as they are given the benefit of the ideas of the entire sales force individually, and criticism is freely asked for where it is believed that the service can be improved. The results of the conference are also of great benefit to the purchasing department.

The meetings are a fixed institution with this company. The company asserts positively that the expense involved is greatly offset by the vast amount of good that is accomplished.

On the evening of the last day of the meeting, there is a banquet which all of the representatives attend, together with the department managers and their first assistants, making a yearly reunion between the sales and inside forces that is looked forward to with considerable interest and anticipation by all concerned.

Before the men arrive in San Francisco, an apportionment is made to each manager of the time which will be required for his respective department, based upon the total number of days available.

ILLUMINATION FOR INDUSTRIAL PLANTS[1]

A Discussion of the Importance of the Lighting Question in Manufacturing Industries.

By G. H. Stickney.

The problems of industrial illumination include the lighting of offices, yards, elevators, stairways and other accessories, but it is the purpose of this paper to treat principally of artificial illumination for the actual processes of manufacture.

Electric light is being adopted generally as the standard of the best practice, furnishing the safest, most economical illuminant available, therefore this paper will treat of electric lighting only.

All industrial processes are subjected to a close cost-scrutiny. Pressure is placed wherever it seems possible to reduce cost. The lighting bill, holding as it does an indirect relation to the resulting product, is often discriminated against. Although it is seldom practicable to estimate accurately the relative values of different degrees of illumination, it is well known, however, that an average workman can do more and better work with an illumination of suitable intensity than with a weaker light. Figures have been published which show the relative rate of production by daylight and by artificial light in particular installations. In every case the superiority of daylight has been startlingly demonstrated. Unquestionably in the majority of manufacturing plants today, raising the standard of illumination would justify its cost, in the improved quantity and quality of production.

Individual Lights Not the Best.

In revising the lighting of plants to take advantage of new developments, the manufacturers have in a number of instances expressed surprise at the marked improvement in production due to the better illumination.

The operative is an important factor for consideration in any lighting proposition. Since the light is provided primarily for his use, in order that he may perform his work advantageously, it follows that it should be suited to his needs. To be satisfactory the illumination should enable the workman to perform his work quickly and well, without excessive eye-strain. The illumination can increase his efficiency by making him at ease with his surroundings, or it can render him dissatisfied.

It is seldom practicable to equal daylight, and therefore it is usually advantageous to pay as little attention as possible to the artificial lighting. One of the serious objections to placing a small portable light under the control of the workman is that he is inclined to experiment with it, not only wasting his time, but often placing the light so as to produce a glare in the eyes of his fellow workman or himself. Such an arrangement is soon followed by eye-strain, and the workman feels a desire for more light. An increased light only makes matters worse, and at the same time calls for a higher current consumption. We have revised such installations when it was possible, cutting the current consumption in two, by going to general illumination and still providing ample working illuminations.

The Attitude of the Workman.

Such a change is usually resisted at first by the workman partly because the strained condition of the eyes makes it require more light for clear vision and partly because the workman thinks an inherent right is being taken from him. If the change can be made diplomatically, perhaps providing additional intensity for the first few days, it is not unusual that a considerable reduction can be made, and at the same time a light furnished which is really better for the employe. In making such a change the operator should understand that the new system is an accepted success elsewhere. If it is treated as an experiment and the workman's opinion asked, he is apt to become over-critical.

The lighting system in any building or room should be arranged so as to fit the conditions. Likewise the building should conform as far as possible to the requirements of good lighting. The finish of a room affects the efficiency of a lighting installation considerably. A dark finish is rich and pleasing to the eye, but in a workroom it is often extravagant. Whitening the walls, pillars and ceilings of a room will produce a remarkable increase in the effectiveness of the light.

A high-studded room sometimes requires more power to light than a lower room, but it permits the use of larger units with wider spacing. This is desirable from an installation and maintenance standpoint. It is common practice to space lamps one and one-half to two times as far apart as the height above the work.

Especially in large rooms the use of low glaring lights should be carefully avoided, as the lamps brought together by perspective are distressing to the eye. The higher the lamps are hung the less the necessary precaution to avoid glare. Modern factory buildings have as large window areas as possible. While this construction increases the effectiveness of daylight, it requires a higher intensity of artificial illumination. This is partly because operators accustomed to strong illumination require relatively strong artificial illumination, and partly because of the loss of the artificial light through windows. Where conditions permit the use of white curtains, much light can be reflected back and retained in the room. It is well in arranging lamps in a room to favor those parts which have the best daylight, because in arranging the work the processes requiring the most light are located near windows.

The Systems Contrasted.

There are two principal ways of lighting a room; namely, by local illumination and by general illumination. Where the former method is followed, a small lighting unit is placed at each point where particular illumination is required, the remaining parts of the room depending on stray light or a low general illumination. For general illumination, the room or section is lighted by systematically placed units so arranged that all parts receive approximately the same illumination. Relatively large lighting units are used, depending in size upon the dimensions of the room and degree of illumination required.

With general illumination the arrangement of lamps, being independent of the detail location of ma-

[1]Abstract of paper read at joint meeting of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers, Boston, Feb. 16.

chinery, does not require change with rearrangement of the work. General illumination does away with temporary construction and unsightly drop-cords, and the accompanying high depreciation, and, in many cases fire-risk. The use of drop cords among stock shelves is especially to be deprecated, on account of the lamp down where there is danger of causing fire. With properly labeled shelves, a permanently installed lamp above the aisle will provide necessary illumination.

When lighting processes in an open room, general illumination can be used economically where work is concentrated, but where there are just a few widely separated points that require light the method of local illumination will be the cheaper. The choice between the two methods often depends upon the process. General illumination gives a softer and better diffused light, but will not furnish light in a deep boring as readily as a specially placed local lamp. General illumination permits the use of the most efficient illuminants, with least wiring and maintenance expense.

Artificial Light Supplants Daylight.

In order that a process may be properly illuminated it is necessary that it should be understood by the illuminating engineer. He must know how the light is to be used in order to determine intelligently the most desirable intensity, degree of diffusion, direction and color of light. In a textile mill, for example, the weave room is more exacting in lighting requirements than the spinning and carding rooms. Colored goods require more light than white goods. Different types of looms have different requirements as to direction of light. In high-grade work where there is shading of colors, white light is demanded.

An interesting intensity problem was presented by a leading rifle manufacturer, who was unable to obtain suitable artificial illumination on the targets of a 220-yard testing range. Measurements showed that the marksman required 25 to 30-foot candles for satisfactory work. Daylight intensities were running as high as 60 or 70 foot-candles, but the artificial illuminants, as installed, were giving only about six or eight foot-candles. An equipment which gave about 30 foot-candles was installed and gave immediate satisfaction. Later it was decided to eliminate daylight altogether, as the steadier artificial light gave more uniform results.

In machine shops, general illumination can ordinarily be used to good advantage, although some special operations require local lighting. Such local lighting is sometimes provided by loaning extension lamps to the workmen on check, after the practice followed with tools. This practice is often used for automatic machinery, where special light is required for setting up, though a low general illumination is suitable for regular operation. Ordinary machine shop work requires about three foot-candles, though for rough work one foot-candle is often satisfactory; while for fine work six or more foot-candles may be required.

Belts an Interference.

The presence of many overhead belts makes the elimination of shadows with general illumination more difficult, and also is apt to be destructive to droplights. Modern shops use as few overhead belts as practicable.

In a large clothing factory recently completed remarkably satisfactory results are being obtained by general illumination from tungsten economy diffusers. This suited all processes, the number and size of lamps in each diffuser being varied to meet the intensity requirements of the different departments. Some difficulty was found in seeing the seam at the middle point of a sewing machine when working on black cloth. This ordinarily would require a local lamp. Preliminary experiments with a local reflector for casting a special beam of light at this middle point indicate that this form of local lighting can be satisfactorily applied.

In drafting rooms at least six foot-candles should be provided on the drawing board. The selection between general and local illumination depends upon the arrangement of the room and other conditions. Where local lighting is used lamps should be shaded to cut off glare, and if possible located out of the draftsman's reach over the table and a little to his left.

Determining the Circuits.

The circuits for feeding factory lighting are usually determined by the central station current available, or the requirements of the electric motors in the plant. Either direct or alternating current can be used to equally good advantage for lighting, except that arc lamps do not give a steady light on 25-cycle circuits. Wherever possible the voltage of the lighting circuit should be between 100 and 125, as the most efficient lamps are more readily applied to these voltages. A 220-volt, three-wire circuit is commonly used to good advantage.

Where motor service is intermittent, affecting the voltage regulation of a local circuit, it is desirable to separate the lighting and power circuits as far as possible. In some of the largest textile mills in New England, where the supply is alternating current, the general illumination is provided by means of series direct-current arc lamps. This furnishes a white light with remarkable economy of current consumption and maintenance. Series circuits in general, however, should be avoided except when they can be safeguarded.

The lamps available for industrial illumination may be considered under two classes; namely, incandescent and arc lamps.

The principal types are as follows:

Incandescent:	Arc:
Carbon.	Enclosed carbon.
Glower.	Intensified carbon.
Tantalum.	Mercury.
Tungsten.	Luminous, magnetites.
	Flame carbon.

None of these lamps are suitable for all conditions of lighting. It is often desirable to use several types in different parts of the same plant. Incandescent lamps are usually made up as small units, but may be combined or grouped so as to form larger units. The carbon incandescent lamp has a high specific consumption and is economical only with very low price of power, or in small portable units. As it will stand rougher handling than any of the other forms, the carbon lamp is ordinarily used with extension cords.

The Selection of the Lamp.

Tantalum lamps are finding a considerable use in manufacturing plants, especially where direct current is available.

The tungsten lamp has practically revolutionized commercial lighting and is now being extensively adopted in industrial lighting, especially in textile mills. It is by far the most efficient of the incandescent class, and while the maintenance seems high in some cases, it is being rapidly reduced with the progress of development. Where lamps are protected from excessive vibration or shock, the tungsten is giving an exceedingly long burning life. In choosing between the tungsten and tantalum, the cost of current and the size of unit desired are usually determining factors. Tungsten lamps are used singly or in groups with metal diffusers or prism glass reflectors.

Where there is considerable building vibration, they are provided with spring suspensions. In equipping and arranging lamps thought should be given to determining where the light is wanted and what degree of diffusion is required. Where there are dark ceilings, all upward light is wasted, as far as lighting the process is concerned.

Inclosed carbon arcs, both direct and alternating current, are used to a large extent in industrial lighting. They are efficient as large units and have a very low maintenance cost. For the higher grades of lighting they are often equipped with diffusers to soften the light and direct it downward at desirable angles.

The intensified inclosed arc lamp is now available for direct-current multiple circuits. It is more efficient than the corresponding capacity of the inclosed arc lamp. This lamp and the high-current inclosed arc lamp are superior to all others of color selection.

First Cost a Small Item.

The flaming arc lamp, using the so-called yellow carbons, after several years' use principally as an advertising light, is now being used to a considerable extent for the lighting of foundries, machine shops, etc., where the rooms are high, and where it is desirable to hang lamps above the cranes. The characteristic distribution of this lamp, as now built, is particularly adapted to high buildings since the maximum light is thrown directly downward. The light is very powerful, and suited for lighting large areas when hung high.

The remarkable developments of the last few years, and the remoteness of ideal efficiency, give promise of further development and improvement in illuminants. The importance of these developments in cheapening and at the same time improving the artificial illumination of industrial processes behooves the manufacturer to keep abreast of the times. It should be borne in mind that the first cost of almost every type of electric lamp is relatively small, as compared with the cost of a year's operation, so that the user can afford to take advantage of the developments, even to the extent of throwing out his old lamps and putting in new ones at reasonable intervals.

Joseph E. Thropp blew out its Saxton, Pa., stack, which had been blown in Feb. 15, because of a broken flywheel. The hearth and bosh will be relined.

STEEL PROBLEMS

Under Consideration in This Country and in Foreign Lands.

Office of THE IRON TRADE REVIEW,
Post Bldg., Washington, D. C., Mar. 8.

Apropos of the work that is being done under the auspices of the government, or rather through the medium of the bureau of standards and the Interstate Commerce Commission, to discover ways and means for prolonging the life of steel rails, it is interesting to note that some attention is being given to a variety of problems connected with this subject in this country and foreign countries.

A bill has been introduced in the senate by Senator Penrose, of Pennsylvania, the object of which is to appropriate $25,000 to the Franklin Institute of Philadelphia, and the Purdue University, of Lafayette, Ind., "for the purpose of determining the quantity of the so-called 'hammer blows,' 'centrifugal lift and tangential throw' of locomotive driving wheels in use on American railroads; also the effects produced thereby."

In regard to the steel rail question, a report has been received at the bureau of manufactures in the commerce department from Belgium regarding the testing of heavier rails on a portion of the international railway line in that country. It is said in this report that the work commenced two years ago is now about half completed. Further the report says:

"It is asserted that the results so far are highly satisfactory, the trains running on these new rails without jar or shock and much smoother than heretofore. A difficulty has been strengthening the joints. Fish plates are used, 46 inches in length, resting on three wooden sleepers, one immediately under the joint of the rails and one at either extremity of the fish joint. This arrangement has given excellent results, eliminating the shock caused by the wheels of cars passing over joints. The new rails weigh 1,026 kilos (2,257 pounds); they are 18 meters (58½ feet) long, and are screwed onto 26 sleepers. The old rails of 40 kilos (88 pounds) per meter (39.37 inches) were spiked onto 20 sleepers. Placing the new rails is slow, as traffic is excessively congested."

In response to numerous inquiries regarding the manufacture of steel railway sleepers and their increasing use in certain sections of Europe, following the publication of his report on the use of steel railway ties, Consul H. Albert Johnson, of Liege, has collected data, blueprints, pamphlets, etc., from a number of the leading manufacturers of Belgium, Germany and England, which he now transmits. These will be loaned to interested firms by the bureau of manufactures. The consul adds:

"Judging from the information received, it seems generally conceded that the steel sleeper will eventually supersede the wooden tie in most of the countries of Europe, owing in a great measure to the continually increasing scarcity, and, therefore, relatively high price of lumber. Germany at present seems to be the European country in which the use of the steel sleeper has become most prevalent. Only one firm stated prices for steel sleepers, with keys, quoting £6 ($29.19) per ton, delivered f. o. b. Middlesbrough, Eng., the place of manufacture."

NEW CATALOGS.

ELEVATOR CONTROLLERS.—The Cutler-Hammer Mfg. Co., Milwaukee, has issued a 128-page 5 x 8-inch catalog descriptive of the Cutler-Hammer controlling devices designed for use with alternating and direct current motors on passenger or freight elevators.

MACHINERY AND TOOLS.—The Harold L. Bond Co., Boston, Mass., has issued a 288 7 x 10-inch page catalog descriptive of its line of railroad, mill and contractors' tools and machinery and supplies.

TURRET LATHES.—The Gisholt Machine Co., Madison, Wis., is distributing a handsome 64-page 8 x 10-inch catalog describing its line of turret lathes, vertical boring mills, horizontal boring machines and tool grinders. The catalog is well gotten up and the illustrations and stock are excellent.

AIR COMPRESSORS.—Publication No. 387 of the National Brake & Electric Co., Milwaukee, is devoted to its type "3VS" motor driven air compressor, in single, double and three-cylinder types, stationary and portable, with tables of dimensions and capacities.

METAL LOCKERS, LAVATORIES, ETC.—The 32-page 6 x 9-inch catalog of the Manufacturing & Equipment Co., Boston, describes a line of metal furniture, lockers, factory lavatories, single or in multiple, racks, shelves, etc.

BOLTS AND NUTS.—The 1910 catalog of the National Bolt & Nut Co., Pittsburg, 76 6 x 9-inch pages, describes a general line of hot and cold pressed nuts, forged nuts, machine, carriage and railroad track bolts, turnbuckles, lag screws, etc.

HYDRAULIC VALVES AND FITTINGS.—The Watson-Stillman Co., New York, has issued catalog No. 78, 120 6 x 9-inch pages, descriptive of a line of valves and fittings for hydraulic work, together with a list of the publications issued by the company, referring to its various products.

OIL AND GAS BURNING APPLIANCES.—The W. S. Rockwell Co., 50 Church street, New York, has just issued a new catalog descriptive of the appliances used in connection with its fuel oil and gas furnaces, including special valves, burners, pumping and blowing systems, separators, tanks, etc.

FIRST OPEN-HEARTH STEEL

Made at Sparrows Point Plant of Maryland Steel Co.

The first open-hearth steel made by the Maryland Steel Co. was manufactured at Sparrows Point, March 2, when it put into operation its new open-hearth plant. Work was started on this plant June 7, 1909. There are five 50-ton basic furnaces of the tilting type operated by electric power, as is every other piece of machinery in the plant. The gas which is burned in the furnaces is made by a battery of Hughes mechanically stoked producers of the latest type. Two kilns are provided for the calcining of dolomite used in the furnaces. The best machinery and appliances can be found in this plant.

William E. Underwood, of the Pennsylvania Steel Co., Steelton, Pa., was the engineer of erection assisted by Walter D. Kimball and H. L. Pentz. Mr. Underwood also built the open-hearth plant of the Bethlehem Steel Co.

J. A. Durfee, formerly connected with the Southern Iron & Steel Co., is the superintendent of this new plant, which requires about 150 men to operate.

The furnace building, which is of steel construction, is 459 feet long, not including a 54-foot extension, 165 feet wide and 106 feet high, and covers a space of 84,645 square feet.

Steel will be made in this plant by the duplex process.

This is the second open-hearth plant in the state, the N. & G. Taylor Co. having made open-hearth steel at its plant at Cumberland, Md., for many years.

AWARDED STEAM SHOVELS FOR ORE MINING.

The Oliver Iron Mining Co., user of upwards of 150 steam shovels, has just placed an order for this class of equipment for the coming season with the Atlantic Equipment Co., for its Class 80-18-3 Atlantic steam shovel. The conditions under which steam shovels are operated, in stripping the overburden from the Missabe Range ore deposits, are perhaps more severe than in any other service in which shovels are used. The material is glacial drift. It consists mainly of stiff hard clay full of boulders ranging in size up to a hundred cubic yards. Quicksand, rock and other materials of every description are encountered. The shovels are in service summer and winter, and are worked double shift. The winter service is most severe. The temperature is often as low as 50 degrees below zero. The material is so tough in all seasons that it is usually shaken up ahead of the shovel. Mud shots to break the boulders and frozen lumps are continually being used close to the shovels. The stripping follows very closely the top surface of the ore beds which are not level but run up and down in irregular hummocks and hollows. This year's order for steam shovels was placed with the Atlantic Equipment Co. after a season's test of one of the new design Class 80-18-3 Atlantic shovels in the Mountain Iron and Burt-Pool mines during 1908-09.

ORGANIZATION OF LAWRENCE IRON CO.

The stockholders of the Lawrence Iron Co., Ironton, O., successor to the Bird Iron Co., recently organized by electing these members of the board of directors: A. H. Mittendorf, Col. H. A. Marting, D. C. Davies, Hugh Russell, John E. Williams, of Portsmouth; E. McFarland and James A. Green, of Cincinnati, associated with Matthew Addy & Co. The board organized by the election of these officers: President, Col. H. A. Marting; vice president, D. C. Davies; secretary and treasurer, Captain H. R. Browne; superintendent, J. H. Ferguson. The statement is made that the majority of the capital stock of $250,000 has been subscribed for, and the furnace will be ready for operating in about 60 days, making basic iron.

CHESTER STACK RESUMES.

The blast furnace of the Delaware River Steel Co. near Chester, Pa., which has been banked several weeks by reason of damage to its blowing engines by fire, has resumed operations. The stack is working upon basic for the eastern market.

Stockholders of the Pottstown Iron Co., Pottstown, Pa., recently re-elected these officers and directors: President, Thomas H. Morris; secretary and treasurer, Phillip P. Chase; Theodore H. Morris; Austin Heckscher, W. C. Brown, Leonard Peckitt, Andrew Wheeler Jr., Joseph H. Morris and George Malsberger.

The Wheeling Steel & Iron Co. has declared the regular quarterly dividend of 2 per cent and an extra dividend of 2 per cent, payable March 1. This will make a total of 10 per cent from the earnings of 1909.

DETAILS OF PLANS

For Extensive Improvements to be Made by the A. M. Byers Co.

Announcement is made of some of the details of plans for extensive improvements to be made by the A. M. Byers Co., Pittsburg, which were outlined in a general way a few weeks ago. The plans call for the reconstruction of the Sixth street, South Side, Pittsburg, plant, and for the duplication of a plant at Girard, O. An additional 4,000-horsepower plant, with water-tube boilers, stokers, coal and ash handling equipment, and gas producer plant will be installed at the South Side works. The puddle department will be rebuilt, lap-weld and bell-weld equipment will be installed and the plant will be modernized with the latest improvements in equipment.

The Girard plant is a modern puddle and rolling mill equipped with 42 puddle furnaces, a 24-inch muck bar mill, and 12 and 15-inch finishing mills. It is proposed to double the capacity of this plant, the extensions to be housed in steel frame buildings. The puddle department will be 80 x 500 feet, and the rolling mill 102 x 400 feet. Contracts for structural work for these buildings, involving about 800 tons, have been awarded. It is estimated that improvements will represent an investment of about $1,000,000.

IRON COMPANY SOLVENT.

In connection with the receivership of the Central Foundry Co., New Jersey, a plan has been submitted to keep from any embarassment the Central Iron & Coal Co. of Alabama, the stock of which is held by the involved company. The Central Trust Co., as syndicate manager, will discount the notes of the Central Iron & Coal Co. to the amount of $217,341 to meet a liability of the iron company for the same amount on notes in the hands of the public and in addition to provide for $35,000 working capital for the iron company. Waddill Catchings, receiver of the foundry company, has been authorized to accept the offer. It is asserted that the iron company is solvent and has been operated at a profit.

The La Belle Iron Works, Wheeling, W. Va., has declared a quarterly dividend of 2½ per cent, an increase of one-half of 1 per cent, payable March 31.

The Silver Creek Furnace Co., Rome, Ga., which has been thoroughly rebuilding its stack for some weeks, relighted the furnace March 1.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

The following manufacturing companies have filed articles of incorporation:

The Wehr Steel Co., Milwaukee, Wis.; $25,000; by E. R. Wehr, W. E. Wehr and J. H. Tobin.

The Fulton Machine & Forging Co., Canal Fulton, O.; $75,000; by W. E. Young and others.

The Biloxi Machine Works, Biloxi, Miss.; $12,000; by W. K. M. Dukate, William Gorenflo and others.

The Atlas Foundry Co., Detroit, Mich.; $50,000; by William Christian, Robert Crawford and John D. McKay.

The Superior Drop Forge & Mfg. Co., Cleveland; $150,000; by W. H. Lucas, F. V. Enrich, P. C. Bredel, B. A. Fietter and A. H. Gebhart.

The Semi-Steel Test Foundry Co., Chicago; $10,000; iron and steel castings; by L. L. Falk, Charles G. Rundall, and Willard J. Dixon.

The Munroe-Lilly Engine Co., Omaha, Neb.; $100,000; by Frank A. Munroe, Charles E. Lilly, Charles H. Munroe, and Charles L. Dundey.

The Osage Foundry & Machine Co., Bartlesville, Okla.; $10,000; by H. B. Levy, E. M. Haubold Jr. and E. M. Haubold.

The American Iron & Forging Co., Cincinnati; $20,000; by W. A. Roberts, Henry Gabel, B. G. Waldapfel and others.

The Cincinnati Grinder Co., Cincinnati; $45,000; by Arthur C. Hoffenghoff, Eldon R. James, George C. Kimmel, Alexander G. Wilson, and A. H Fuechter.

The Lancaster Foundry Co., Lancaster, Pa.; $30,000; by William B. Wisner, 328 South McQueen street; D. Miles Shertz, and James R. Haldeman, all of Lancaster, Pa.

The Railway Brake Shoe Co., Washington, Pa.; to manufacture a patent shoe brake for railways; $500,000; J. L. Cohagan, G. O. Devaughn, and Eli Gray, all of Washington, Pa.

The Seymour Metal Goods Co., Seymour, Conn.; $100,000; to manufacture and deal in copper, brass, German silver, steel and metals; by G. H. Weaver, S. C. Boies, and F. A. Rugg, all of Seymour, Conn.

The William Jessup & Sons, Inc., New York City; iron, steel and other metals; $200,000; by William F. Wagner, 91 John street, New York; George Goggill, and Arthur C. Patterson, both of 40 Wall street, New York City.

New Construction:—

The Straub Machinery Co., Cincinnati, is planning to build shops on Knowlton street, between Dane and Crawford.

The Virginia Railway Co. has purchased land at Roanoke, Va., on which it is proposed to build car repair shops that will employ about 300 men.

The Redmon Hardware Co., Shoshone, Idaho, is making preparations for engaging in the manufacture of galvanized steel flumes.

The Powhattan Iron Works, Charleston, W. Va., has awarded the contract for the erection of an addition to its foundry.

The Page-Hersey Iron Tube & Lead Co., Welland, Ont., has completed the erection of its plant, and has begun work with 150 employes.

The Baird Machine Co., of Oakville, has acquired a tract of land near Thomaston, Conn., where it will build a machine shop which will employ about 150 hands.

Henry Disston & Sons, Inc., Philadelphia, is having plans drawn for a two-story file shop, 44 x 179 feet, to be built at the plant at Tacony. It is estimated to cost $25,000.

The Sheffield Car Co., Three Rivers, Mich., a branch of Fairbanks, Morse & Co., has completed a new machine shop, 100 x 600 feet, and has placed it in operation.

The Quakertown Stove Works, Quakertown, Pa., is installing new machinery and equipment in its plant, which has been closed down until the installation is completed.

The Mechanics Machine Co., Rockford, Ill., is having plans prepared for a warehouse to be located near the north of the present plant. The structure will be one-story, 40 x 200 feet.

Chas. W. Lutz, of Pittsburg, is on the ground and in charge of construction work of the Birmingham plant of the American Steel & Wire Co. Actual construction work will begin this week.

W. C. Byington, proprietor of the Byington Machine Works, Tylertown, Miss., advises that he is completing a shop, 42 x 73 feet, of frame construction, in which he will conduct a general machine and repair shop, as well as building machines from his own patterns. He further advises that he has purchased the machine equipment.

The Philadelphia Roll & Machine Co., Philadelphia, will build a one-story machine shop 84 x 117 feet at Twenty-third street and Washington avenue, at an estimated cost of $12,000.

The Comstock-Wellman Bronze Co., Cleveland, whose incorporation was recently noted, is having plans prepared by Engineer V. D. Allen for a plant at Superior avenue and East Sixtieth street.

The Rome Soil Pipe Co., Rome, Ga., has awarded the contract for the construction of the main building of its plant 130 x 150 feet. A machine shop 30 x 50 feet will also be constructed.

The Williams Foundry & Machine Co., Cumberland, Md., which was organized with James B. Williams as president, will erect an ell shape foundry and machine shop, 25 x 90 feet, and 25 x 55 feet, construction having been begun.

The Zanesville Malleable Co., Zanesville, O., is erecting a new cupola which will be completed within the next two weeks. The capacity of the foundry will be increased by one-third, and the number of employes doubled.

The American Car & Foundry Co. has asked the city of Detroit to vacate a portion of Frederick street, adjoining a site upon which the company proposes to erect a foundry large enough to give employment to 1,000 men.

The Southwestern Iron Works, Gainesville, Tex., has decided to remove its shops and to locate at Delmar Heights, near Oklahoma City, Okla., where construction work will be commenced at once. The company will invest $100,000 on the plant, which will employ 60 skilled hands.

The Moline Pressed Steel Co., Moline, Ill., has awarded the contract for a new shop, 60 x 100 feet, saw-tooth roof construction, estimated to cost $5,000. Construction work has been begun and it is hoped that the shop will be completed and the machinery operating in 90 days.

The Moline Plow Co., beside constructing new buildings at Moline, it is understood will erect at Rock Island, Ill., a seven-story warehouse, and a ten-story factory building, in the

latter of which the manufacturing plant of the Monitor Drill Co. will be established.

The Greenburg Corrugated Iron Works, Terre Haute, Ind., has arranged to establish a branch shop at Tulsa, Okla., for the manufacture of corrugated iron pipes, culverts, etc., and contracts have been closed for the site, building, construction, etc. The Tulsa branch will employ 25 men when opened.

The Fremont Foundry & Machine Co., Fremont, Neb., will shortly begin the construction of a brick and steel foundry, 100 x 122 feet, immediately across the street from the old foundry, and the latter will be used hereafter as a cleaning and polishing room for castings. The proposed new foundry will be connected with the cleaning department by a tramway for the convenient handling of castings.

The Denver Rock Drill & Machinery Co., Denver, Colo., has had plans drawn for a plant to be located at 39th and Gilpin streets, for the manufacture of pneumatic drills and mining machinery. The plant will cost about $200,000, and it will employ about 350 men. It will have a capacity of 800 drills per month, beside the other machinery that will be made by the company. Ground will be broken about April 1.

Plans have been prepared by the Bessemer & Lake Erie railroad for several new buildings at the Greenville, Pa., shops, and the installation of additional machinery which will represent an expenditure of about $250,000 or $300,000. The new structures will include an office building for the superintendent of motive power and his staff; a modern 17-stall roundhouse; forge building, 700 feet long; fire-proof pattern shop; an addition to the power plant and a coaling station. Two new 500-horsepower engines will be installed.

The National Fulton Brass Mfg. Co., Detroit, has announced that early in April ground will be broken for a plant estimated to cost $100,000, which will be located just east of the Detroit Steel Products Co.'s buildings on the boulevard, a frontage of 294 feet having been recently purchased. At the annual meeting of the company recently, these officers and directors were elected: President, John F. Harrigan; vice president, Frank E. Beal; secretary and treasurer, W. J. Skiffington; directors, H. H. Hewitt, of New York, C. M. Hewitt, of Chicago, and the officers named.

The Enterprise Foundry & Fence Co., 366-370 South Senate avenue, Indianapolis, has outgrown its present quarters, and expects to move to its new plant in about 60 days, leasing its present foundry and machine shop. It is erecting a new foundry, 65 x 150 feet, and will also put up a new brick office building, besides occupying the old buildings formerly the property of the Mainland Mfg. Co. The site which it has purchased contains five acres and allows plenty of room for expansion. In the past year its business has been very satisfactory, and it is also getting considerable export business, having recently shipped fences to Panama, Columbia, Porto Rico, Honduras, Cuba, Egypt and Nova Scotia.

The Conneaut Shovel Co., Conneaut, O., whose plant was destroyed by fire Dec. 23, has rebuilt in remarkably short time, and has placed the new plant in operation. In 13 working days after starting rebuilding, a brick structure covering approximately 42,200 square feet was up and enclosed, and the fires laid under the boiler. The re-construction included the drafting of plans by G. W. Benton, secretary and treasurer, who also had immediate charge of the construction. The building is fan-shaped, approximately 201 x 210 feet on foundations, with concrete floors and is practically fireproof. Power is supplied by a 60-horsepower automatic engine, and the building is steam heated by a 100-horsepower boiler. The larger part of the machinery in use is automatic, but the old Swedish method of hand work has been adopted as far as possible. The company has orders ahead for 1,000 dozen shovels. The officers are: President, G. M. Brown; vice president, M. G. Spaulding; secretary-treasurer, G. W. Benton.

General Industrials:—

The Columbus Structural Steel Co., Columbus, O., has increased its capital from $50,000 to $100,000.

The Alan Wood Iron & Steel Co., Philadelphia, has increased its capital stock from $3,500,000 to $7,000,000.

The Broughton Bolt Co., Cleveland, has increased its capital stock from $50,000 to $75,000 and it is understood has planned to remove its plant to Elyria, O.

The Texarkana Iron Works, Texarkana, Ark., has filed a certificate of dissolution as a corporation. Its former officers were: President, Frank E. Miller, and secretary, J. C. Edwards.

J. B. Castree & Son, Owosso, Mich., have purchased the blacksmith and iron works business of Arthur A. Stegall, and will remove the plant to the foundry and repair shop conducted by Castree & Son.

The Trust Company of America, of New York City, has foreclosed on the properties of the Lanyon Zinc Co., Iola, Kans., as trustee for the bondholders.

The Standard Cast Iron Pipe & Foundry Co., Bristol, Pa., recently received sufficient orders for pipe to keep the plant running at capacity until mid summer.

The James Foundry Co., LaCrosse, Wis., advises respecting a fire recently noted that the damage was sustained by the storage shed, the loss amounting to about $200.

The plant of the Vincennes Pipe & Casting Co., South Vincennes, Ind., was recently sold at receivers' sale for $5,000, to Louis A. Meyer, attorney, of Vincennes. The company failed last year.

John R. Boardman, Ottawa, Kans., has purchased a half interest in the Wylie Mfg. Co., Oklahoma City, Okla., and will be office manager of the company. The concern manufactures steel culverts and road making machinery.

The Continental Bolt & Iron Co., Chicago, has purchased ten acres at Western avenue, West 43rd and Leavitt streets, on which it is proposed to construct a plant estimated to cost $100,000.

The Philadelphia & Reading Railway Co. has issued orders reducing the hours of labor in all locomotive and car shops to eight hours a day, beginning Feb. 28. It is estimated that this will reduce shop expenses about 15 per cent.

James H. Beans, Martins Ferry, O., successor to William Mann since the death of Mr. Mann last May, advises respecting a recent fire that a little damage was done to the roof of the foundry mainly, causing a delay of only four days.

Schedules as to debts and liabilities of the Globe Foundry Co., of Port Chester, N. Y., have been filed in the bankruptcy court. These show liabilities of $128,847, and nominal assets of $123,467, including stock, machinery, bills receivable etc.

The George E. Wood Tool Co., Southington, Conn., advises that recent published statements in various periodicals to the effect that its works were damaged by fire are erroneous. The fire was in an establishment next door to the Wood company's plant.

The Tyler Tube & Pipe Co., Washington, Pa., replying to an inquiry as to the extent of its recent fire, says

that a little damage was done to the carpenter shop, which is separate entirely from its main buildings, and its loss was so small as not to necessitate rebuilding plans.

The Hayden-Corbett Chain Co., Columbus, O., advises that, while part of one wing of its buildings was destroyed Feb. 25 by fire, yet this did not interfere with its business. Its works are running and it is prepared to get out orders and make shipments with its usual promptness.

The Burch Plow Works Co., Crestline, O., advises respecting the recently noted increase of its capital, that this is simply giving the company more money on which to do business. It will be obliged shortly to build a small addition to its shops, but definite building plans have not been made as yet.

The Waterville Iron Works, Waterville, Me., advises respecting its recently noted incorporation, that at the present time no new building will be done. It will manufacture its line of wood frame machinery for sulphite, soda, and ground wood pulp mills and continue general jobbing as it has heretofore.

The National Car & Mfg. Co., of Chicago, which recently was incorporated by Thos. B. Conroy and others, with a capital of $125,000, will engage in the business of repairing railroad cars. The plant of the Conroy Boiler & Tank Co., at Forty-seventh and Leavitt streets, probably will be utilized and the two interests merged.

At a recent meeting of the directors of the Dayton Malleable Iron Co., Dayton, O., a new office was created, that of assistant general manager, and Ralph A. Herbruck was elected to fill it. The other officers elected were: President and general manager, Pierce D. Schenck; vice president, S. W. Davies; secretary, W. H. Cassel, and treasurer, Adolph Heintz.

The Chicago, Milwaukee & St. Paul Railway Co., whose gray iron foundry at the Milwaukee shops was damaged by fire Feb. 8, estimates that the probable loss will be less than $5,000. Temporary repairs were made, and the plant was again in commission Feb. 14. No change will be made, as all the repairs are along the line of the original structure.

The National Lead Co., in an official statement issued recently, announces that it has acquired an important interest in the United States Cartridge Co., of Lowell, Mass., one of the oldest and best known manufacturers of fixed ammunition, and, incidentally, a large consumer of lead. The plans of the United States Cartridge Co. contemplate additions to and extensions of its already large business.

The Pusey & Jones Co., Wilmington, Del., advising concerning a fire at its plant, says that but little damage was sustained, only the roof and supports of the bending shed being destroyed. The furnaces and other equipment were damaged but slightly. As soon as the adjustment is made, it will put up a new building, possibly of iron. No interruption is had in the meantime to the operation of its plant.

The recent incorporation of the Provo Foundry & Machine Co., Provo, Utah, was made for the purpose of taking over the foundry and machine business conducted by Thomas F. Pierpont, of that city. The capital stock is placed at $50,000. The officers and directors are: President and treasurer, Thomas F. Pierpont; vice president, George M. Smoot; secretary, John Buchi; Alfred Morsley and Andrew Drysdale, directors.

At the annual meeting of the Kalamazoo Stove Co., Kalamazoo, Mich., the following officers were re-elected: President, Edward Woodbury; vice president and general manager, William Thompson; secretary, Adelbert H. Dane; treasurer, Charles A. Dewing. According to reports received, the past year was the most prosperous in the history of the company. The prospects for the ensuing year were declared exceptionally bright.

The Burke Machinery Co., manufacturer of machine tools, which recently moved its plant from Cleveland to Conneaut, O., reports that the new plant is now working smoothly, and the company is turning out its complete line of tools. The new plant is a two-story and basement brick building, 47 x 156 feet. All the new equipment has been purchased and installed, and with the additional floor space the company has more than double its capacity. The company reports that it is from 60 to 90 days behind on orders on all its lines, but expects to be able to have a stock of tools for immediate shipment sometime in the summer. The company is now at work on a design for a new combined boring and facing machine, which it expects to put on the market later.

Trade Notes:—

The Robins Conveying Belt Co. announces that arrangements have been made for the removal of its executive offices and sales, engineering and purchasing departments to the twenty-sixth and twenty-seventh floors and both towers of the Park Row building, 13 Park Row, New York. Occupancy of the new quarters will be completed by Mar. 12. This suite is the one occupied by the Robins company up to two years ago when the general offices were removed to the works at Passaic, N. J., and a branch office opened in the Terminal buildings at 30 Church street, New York. The office at the Church street address will now be discontinued and combined with the other offices in the Park Row building.

The New York office of the Passaic Structural Steel Co. moved, March 1, from 170 Broadway to 30 Church street, Hudson Terminal building. This company is the successor to the Passaic Steel Co., which went into receiver's hands Dec. 30, 1907.

Fires:

The plant of the New Milford Foundry & Machine Co., New Milford, Conn., was seriously damaged March 1, the loss being estimated at $15,000.

The pattern shop of the Gardner Foundry Co., Lockport, N. Y., was damaged by fire to the amount of $1,500, Feb. 22, the loss being fully covered by insurance.

The main building of McGregor's boiler shops, at Cheboygan, Mich., were badly damaged Feb. 26, the loss being placed at $10,000. The building will be replaced as soon as possible.

The shops of T. C. Richards Mfg. Co., Winsted, Conn., brass novelties, was damaged Feb. 23, to the amount of about $100,000. The shop of the Winsted Edge Tool Co. was damaged about $2,000.

A fire in the plant of the Guerney Foundry Co., Hamilton, Ont., Feb. 17 damaged the building and stock about $3,500, and caused the death of two employes who were suffocated by the heavy fumes arising from the burning lacquer.

The plant of the Milwaukee Stamping Co., corner Sixty-fourth street and Pullen avenue, West Allis, Wis., was badly damaged by fire Mar. 1, the loss being estimated at $50,000. The cause of the fire is undetermined as yet. The company manufactures hardware specialties.

The main building of the plant of the Western Stove Works Co., Peoria, was badly damaged by fire Feb. 17. The loss on the foundry is estimated at $12,000, about half covered by insurance. The burned wooden structure will be replaced by a brick building. The officers of the company are: President, Willard Clark; vice president, Joseph Ossenbeck, and secretary-treasurer, Jacob Ossenbeck.